NATURE MAGAZINE

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JULY 1928 35¢ VOL. 12. NO. 1

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The American Nature Association

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Organized to Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

One of the most remarkable things about the Outdoor Good Manners and Billboard Restriction Campaign is the momentum that it has gained and is continuing to gain. The editors of the country are giving it generous support and contributing greatly to public education,—which, after all, is the final solution of the problem.

Reports of progress and accomplishment are being received from all parts of the country by the American Nature Association. Recently the Roosevelt Highway, a beautiful scenic route running some 400 miles along the Oregon Coast from the mouth of the Columbia River to the California State line, was opened. Immediately the invasion of the familiar signboards began. George W. Soranson, secretary of the Chamber of Commerce of Port Orford, Oregon, stepped into the breach. After an uphill fight he succeeded in getting the offending boards removed, and has circulated the property owners along the route to obtain pledges that they would not lease their property for signboard use. Mr. Soranson and his organization have set the pace for other organizations throughout the country.

For the use of organizations and individuals active in the campaign for Outdoor Good Manners and Billboard Restriction, the American Nature Association is making available on request a large sheet,—suitable for posting on bulletin boards and other appropriate places,—on which are reproduced a group of the most telling cartoons ever drawn to express the ideas of this campaign.

Mats of three of these cartoons are also available for the use of editors. Any editor desiring them may have them on request to this office.

In New Jersey fifteen local Granges have gone on record against the erection of billboards along rural highways, declaring that "the commercial billboards are turning private property to an objectionable use".

In Wisconsin farmers of Waukesha put on a novel display at a recent county grain and stock exhibit when they exhibited a huge pile of signboards removed from their property.

The Shade Tree Commission of Union County, New Jersey, has been actively campaigning against unsightly advertising signs on rural roads. More than 60,000 signs, ranging from a few inches to a wooden billboard, have been removed. In Lakewood, New Jersey, the Shade Tree Commission has been actively enforcing the ordinance against the attaching of any sign or device to trees. They are particularly appealing to the workers for candidates for public office to keep their signs in appropriate places instead of on roadside trees.

In Birmingham, Alabama, Mr. George B. Ward is leading an aggressive and successful campaign against unsightly billboards and for the protection of wild flowers. He is working through the press and through the influence of his many friends and co-workers in conservation activities in that state. He is personally sending out a crew of laborers to take down all illegal tin and pasteboard signs they can find.

An excellent idea is advanced by C. Edward Graves, secretary of Friends of the Western Mountains at Arcata, California. He suggests that post-cards be prepared with the following text:

"Dear Friend: On approaching your city over the highway I noticed an unsightly bill-board advertising your firm or products. Believing, as I do, in confining such advertising to strictly commercial locations, I wish to serve notice herewith that I shall *not* patronize your establishment nor buy your products while I am in your city. You should realize also that there are thousands of other motorists who feel on this subject as I do, but who fail to send you written notice of their feelings.

Very truly yours".

These could be made available to motorists, Mr. Graves suggests, and they would find it very simple to drop a few in the mail in each city, the approach to which was made through a section offensively billboarded.

These are only a few of the reports and reactions received. The movement is going forward rapidly and the American Nature Association is at the service of those who are working locally. Let us help if we can.

Wayside Stand Contest

A third phase of the campaign and contest for better Wayside Refreshment-Stands is announced by the Art Center of New York and the American Civic Association of Washington. This contest provides prizes for the first model stands erected from the plans chosen as the winners in the second phase of the contest. Plans can be obtained from the Art Center, 65 East 56th Street, New York, as well as full details about the competition.

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Travel DEPARTMENT

Readers of this column are urged to write to the Travel Editor for any information desired relative to travel, whether it is for short distances or long distances. To every inquirer will be sent, by return mail, some definite information and this will be followed by special literature regarding the places about which they desire information. This department is designed to be of direct personal service to the readers of this magazine.

The northern coast of Maine is rugged and precipitous, dotted with many islands, the most important of which is Mt. Desert, about fourteen miles long and seven miles broad. This island contains thirteen beautiful lakes, and an equal number of mountains, while the famous resort of Bar Harbor nestles on the north side. Between Mt. Desert and the other islands small steamers carry many visitors each year. On the mainland of Maine, mountains and lakes vie with pine forests and rolling farm land for the favor of the tourist. Summer colonies are sprinkled along the coast and camps abound on the lakes of the interior. It is an ideal summer climate. The roads for motoring are excellent, and special summer train service is now in effect.

New Hampshire is the home of the White Mountains and as such has been termed the "Switzerland of America". As a summer resort its popularity is unquestioned. Six mountains, known as the Presidential Range, are dominated by Mt. Washington, the highest peak in New England. An interesting trip on a cog railway can be made to the top of Mt. Washington where there is an inn from which is obtained a glorious view of the entire range. Anyone who has motored through New England is familiar with Crawford Notch, the Flume, Echo Lake, Franconia Notch, the Old Man of the Mountain, and Lost River, principal freaks of nature set in the midst of magnificent country. Fine roads wind through forests and farm lands, passing quaint New England villages and beautiful summer resorts. New Hampshire thoroughly deserves the great popularity it enjoys.

Even closer to central points are the vacation lands of New York State,

Camera-Hunt the Rocky Mountain Goat in **Glacier National Park**

Being a United States game sanctuary, where shooting is prohibited, this million-acre mountain playground affords an unusual opportunity to stalk with a camera many interesting animals.

Great numbers of picturesque Rocky Mountain goats may be glimpsed all along the main ranges through the Park. Here you will also find bighorn sheep, blacktail and whitetail deer, black and grizzly bears. Approximately 1,000 head of elk range through the densely timbered sections of the Park. There's sport aplenty, too, for those who like to tussle with cut-throat trout and other gamy fish.

Plan now to come to Glacier National Park—picturesque mountain home of the Blackfeet Indians—this summer. You can travel there on the New Oriental Limited—finest train to the Pacific Northwest—at no extra fare. Write for illustrated books.

Your Adventureland vacation should include a visit to the new Prince of Wales Hotel in Waterton Lakes National Park, an extension of Glacier National Park across the international boundary into the Canadian Rockies.

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Send me free books describing recreation in Glacier National Park, also cost from this point of a_____day stay in the Park for a party of_____. I am particularly interested in:

☐ General Tour of Park ☐ Pacific Northwest Coast Tour

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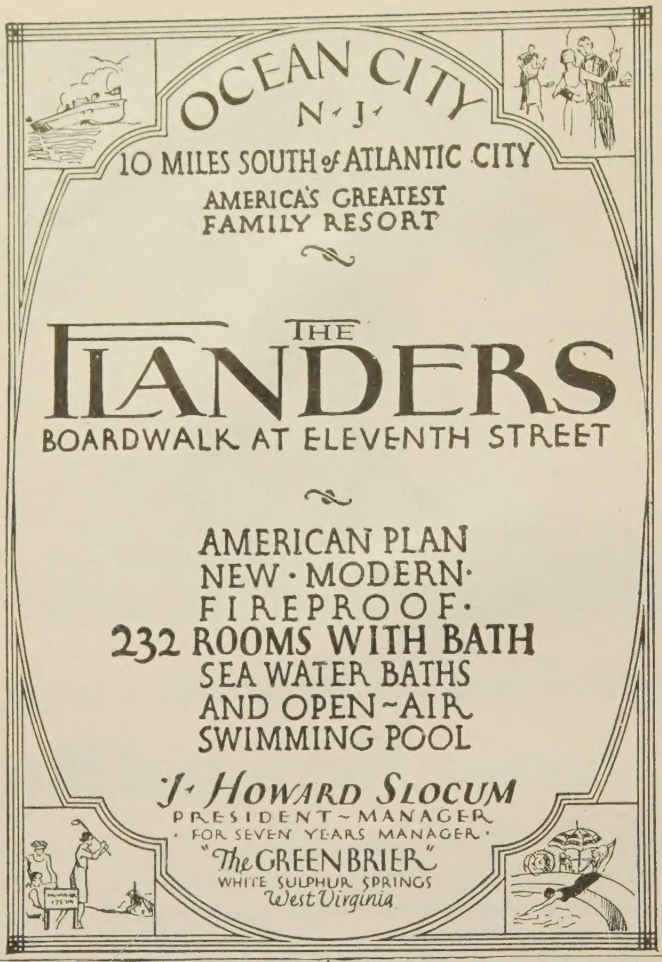

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CANADIAN CRUISES

12 days, New York—Quebec via Halifax, N. S.

A day each way at Halifax and two days at Quebec for sightseeing.

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connected with the cities by excellent train service and motor roads. In the northern part of the state two lovely lakes, Champlain and George, lie between the Adirondack and the Green Mountains. This section abounds with delightful camps and colonies, with the desired combination of mountains and water. To the west are the Great Lakes. In the last several years the boat trips on the Lakes and up the St. Lawrence River have become increasingly popular. Starting with a visit to Niagara Falls, then stopping to glimpse such places as Toronto, the Thousand Islands, and Montreal, these trips offer a diversified pleasure hard to equal. Along the Hudson River, within easy reach of the city, lie the Catskills. The charm of scenery and climate, and the accessibility of these mountains draw to them a host of summer sojourners.

We have several times mentioned one or another of the National Parks, and the advantages they hold out to tourists. Those especially who are interested in nature cannot help but realize that the protected parks are among the few places where man has not attempted to interfere with natural conditions. Each of the parks is easily reached by railroad, and either horses or motors can be obtained at the entrance. Or one may plan a hiking trip over new trails. Yellowstone with its geysers, Glacier with its towering mountains and close to one hundred glaciers, and Yosemite with its falls and Merced River Valley, are all popular parks. In addition to these there are numerous smaller Parks. Information and literature relative to any of these will be sent upon request.

For those unaccustomed to travel, or for the more sophisticated who prefer to have all arrangements made for them in advance, thus insuring the best possible accommodations, independent tours are highly recommended. These trips are fostered by travel companies. You plan your own itinerary to include the places you wish to visit, and the travel agency makes all hotel and railroad reservations for you, and arranges the details of the trip. It is not necessary to travel with a large party and a guide. With your private party you can still have all the conveniences of prearranged Tour Travel.

We are daily receiving literature from railroads and travel agencies concerning their western trips. These run from tours of 10 days to those of an entire summer. Most of them have

Glacier, Yellowstone or Yosemite as their main feature, and some include not only these but also Alaska cruises. When considering these or similar trips, it is well to remember the decided reduction in rates offered by the railroads during the summer season.

Colorado is being greatly featured this year as a summer playground. The climate is pleasant, the mountains and lakes entrancing. There are more than 3000 species of wild flowers, abundance of wild life in its National Parks, and greater wealth of bird life than in any other inland state. In order to appreciate these points the most popular diversions are hiking, mountain climbing, and horseback riding. The new Fall River Road in Rocky Mountain National Park has opened the scenic regions west of the Continental Divide to the motorist, and it is anticipated that this route will be much travelled during the summer.

An innovation in travel in Canada is announced by the Furness Bermuda Line. The S. S. "Fort St. George", during the summer months, will be used for four "Quebec Cruises". These are of 12-day duration, and particularly popular with those who have only two weeks vacation. The sailings are from New York. From there the route lies northward to Halifax, then up the beautiful St. Lawrence River, and the Saguenay River and on to Quebec, and return. Scenically the trip is hard to surpass, for the rugged coast lines of Canada and of the St. Lawrence are always in view. Historic Quebec, with its narrow streets and quaint buildings, gives one a taste of the old-world atmosphere. A trip is also made to the shrine of St. Anne de Beaupre, near Quebec.

The western part of Canada, reached by the Canadian Pacific and Canadian National Railroads, contains four resorts of great beauty. Of these the best known are in the same section—Banff, in the region of peaks, glaciers and canyons, offers motoring, swimming, golf and riding; close by is the glorious Lake Louise, noted for its deep opalescent blue waters mirroring banks covered with brilliant flowers, and the surrounding snow-capped mountains. Further north is Jasper National Park, containing the highest mountains in the Canadian Rockies, and a wealth of wild life. On the United States border, touching Glacier Park, lies the Waterton Lakes Park. The fine new Prince of Wales Hotel will undoubtedly bring this little known section before the public eye.

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TRADE MARK REG. U.S. PAT. OFFICE
AMERICA'S FAVORITE CAMP STOVE

Kampkookery is an interesting hand-book on motor camping containing many helpful hints you won't find elsewhere. Sent free on request.

Whip the streams; land your speckled beauties—and then what? Kampkook them. For wholesome, hunger satisfying camp meals, nothing quite equals Kampkooking.

This sure fire camp stove is going full tilt in two minutes. Burns gasoline, works in any wind or weather. Bakes and broils as well as it fries and boils. Most experienced campers use Kampkook. Take a tip from them. Your dealer can supply you.

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SPEED, sport, pleasure—never before have Evinrude motors given so much of each. Four remarkable twin cylinder models:

Speeditwin—16 H. P., only 85 lbs., 6 to 35 m. p. h. Power increased 100%.

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Evinrude Boat Speed Guide tells you exactly which motor to buy to give you the speed you want on the boat you own. Insurance policy against fire and theft from $1.10 to $2.10, depending on your model. Time payments—as small down payment as $31.10 puts an Evinrude on your boat.

Write for 1928 Evinrude Year Book
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EVINRUDE

We had lost the trail

UP IN the big woods last summer, we were headed back to camp late one afternoon when we missed the trail and wandered off in the dusk. Say, what an experience! It took us all night to find camp and every one of us swore on the spot he'd never leave again without a good flashlight. Not after that experience!

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Remember!
The California Issue
in October

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(In Color)

Drawn by EDWARD KNOBEL
under the direction of RALPH HOFFMANN

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Cedar Bird	Barn Swallow
Chickadee	Chimney Swift
Purple Finch	Scarlet Tanager
Flicker	Wood Thrush
Goldfinch	Red-eyed Vireo
Ruby-throated Humming-Bird	Black and White Warbler
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Kingbird	Downy Woodpecker
Baltimore Oriole	House Wren

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Photographic DEPARTMENT

L. W. Brownell, Editor

Please give me advice on making, keeping and using the fixing bath:—P. F. H.

Carelessness in the making and keeping of the fixing bath and in the handling of the plates, films and prints in it, may often cause the photographer a lot of trouble. No one can tell by looking at a print whether or not it is thoroughly fixed and even with films and plates, when they seem to be perfectly clear, they are often insufficiently fixed as we may find to our sorrow a little later.

Unless one is developing practically every day it is much the safer plan to make a new batch of fixing solution for each lot of prints or negatives developed. A print that is not thoroughly fixed is not permanent and will soon fade and discolor. A negative that is not thoroughly fixed will soon commence to show discolored stains that effectually ruin it. It is always safer to err on the safe side and discard a fixing bath that has been used a number of times even though it may still be good rather than take the chance of spoiling our negatives or prints.

A fixing bath is made of water, hypo and a hardening and clearing solution. The following are two good formulae for plates and prints: For plates, Water, 48 oz.; Hyposulphite of Soda, 1 pound; Sulphite of Soda, 1 oz. In another solution take Water, 16 oz.; Chrome Alum, 1 oz.; Sulphuric Acid, ⅛ oz. When both solutions are thoroughly dissolved pour the second slowly into the first while rapidly stirring the first. This solution keeps for some time and will fix a large number of plates but when the plates begin to clear slowly in it it should be discarded and fresh made up. For prints: Water, 64 oz.; Hyposulphite of Soda, 1 pound. In another solution, Water, 5 oz.; Sulphite of Soda, ½ oz.; Commercial Acetic Acid (28% pure), 3 oz.; Powdered Alum, ½ oz. After thoroughly dissolving the ingredients in each solution slowly pour the second into the first, thoroughly mixing them together. If one wishes he can keep a stock solution of the hardener on hand, for it will keep indefinitely, and add it to the plain hypo bath when ready to use it. The following is an excellent formula for a stock solution: Water, 80 oz.; Sulphite of Soda, 8 oz.; Acetic Acid, 48 oz.; Powdered Alum, 8 oz. One ounce of this solution to 8 ounces of the hypo solution (given in the print fixing bath formula) is the proper proportion to use.

Thorough fixing is almost more important than thorough washing if we would make a permanent print. They should not be fixed for more than thirty minutes or less than ten. They should be fixed face upward and when first placed in the bath should be moved about for a short time. When fixed face downward air bells are liable to form under the prints which prevent the hypo from acting upon them in that particular place, thus causing round, dark spots on the print.

She Knows Her Smokes

CRUISING THE CANADIAN

LABRADOR

by
Howard H. Cleaves

"You have heard of the *wild west*" writes Mr. Cleaves. "This is the *wild east*. The country has changed but little since Audubon's voyage in 1833. For more than three months we never slept on land. We encountered Indians, birds, seals, icebergs, fog, gales. There were no automobiles and I almost forgot how to dodge them. We gorged ourselves on native berries, salmon, herring, codfish, trout. Once I ate porpoise. It is tender and tasty."

This new lecture, illustrated by motion pictures and expertly hand-tinted slides, has proved an outstanding feature in the courses of clubs, schools and institutes during the present season.

Other lectures by Mr. Cleaves are:

Wild Life Adventures
Outdoors in the West
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None but the very best chemicals should ever be used and it is always a mistake to buy any but the tested and guaranteed chemicals that are sold by all reputable stock houses.

Could I prepare slides having verses typewritten on them?—L. A. H.

Yes, in the following way: First the typewriting should be done on a machine whose type is very clear and whose ribbon is jet black. A negative should be made by photographing the typewriting on a slow, or better still, a process plate, so that the image may have perfectly clear letters upon a dense black background. The image should also be the exact size that it is wanted to be on the slide plate so that the latter may be made from it by contact printing. To do this, place the negative in a printing frame with the slide plate face to face with it (in a dark room, of course) and center with the verse, or whatever the writing may be, on it by holding it up to the ruby light to find the exact center. Expose for only a fraction of a second about one foot from an incandescent light and develop in the regular way.

Does the lack of the swing back on a camera interfere with the making of architectural subjects?—M. W. M.

Yes, very seriously. Very frequently when photographing buildings it will be found necessary to tilt the camera upward in order to include the entire building on the plate. When doing this vertical lines will be seen to converge at the top of the picture. This is a very serious defect as it gives the building the appearance of falling over backward. By tilting the swing back forward at the top so that the back is vertical the lines of the picture will again appear in correct perspective no matter how much the camera may be tilted upward.

Does a short bellows interfere with the taking of distant scenes?—M. W. M.

No. Distant views do not require much of an extension of bellows. The closer the object is to the camera the more the bellows must be extended in order to obtain a sharp focus. With cameras having bellows extensions of twenty, or more, inches, it is possible to make a photograph with the lens no more than a foot from the subject, thus making considerably more than life-size images.

How can a good outline print of a leaf be obtained?—H. A. W.

This may be done either on any one of the gas-light papers, or on any of the printing out papers. If on the former the leaf should be arranged on a glass in a printing frame and a piece of the paper carefully placed over it (in a dark room, of course). Clamp down the back, give an exposure of about fifteen seconds at one foot from an incandescent light and develop in the regular manner. If a printing out paper is used the process is the same except that the printing should be done in the sunlight until the portion underneath the clear glass has turned a dark reddish

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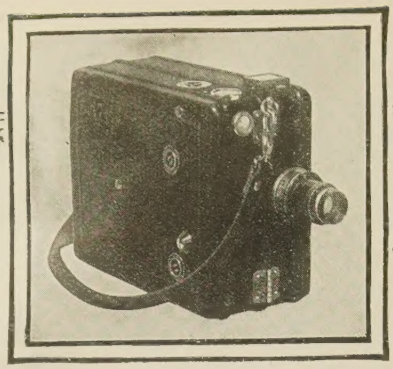

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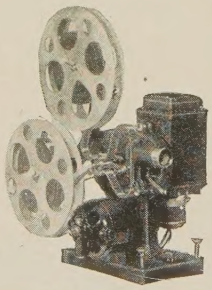

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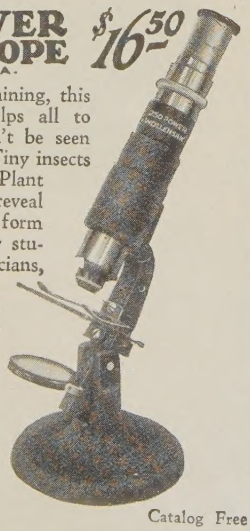

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J. ALDEN LORING
Box K O-we-go, N. Y.

brown, then it should be toned and fixed with the regular solution that can be purchased at any supply house. With this paper it is possible to make a fairly good print simply by fixing in a hypo bath if it is allowed to print until the exposed parts of the paper are almost black. This paper has the advantage that it can be used in the field. The leaves can be printed as they are collected, provided they and the paper are placed in the printing frame in the shade and not in the direct rays of the sun, then returned to some light-tight carrier and taken home to be toned and fixed.

New Movie Camera

The Bell and Howell Company of Chicago have just announced a remarkable new motion picture camera,—lower-priced, pocket-sized and built like a watch. The new camera bears the title of "Filmo 75". It is built for lightness and compactness and at birth tips the scales at three and one-half pounds. It can be operated and held in one hand. The machine is made in three finishes and is quite the de luxe member of the amateur movie camera group and still sells at a price one-third less than the original Filmo. This department will be glad to have sent to any reader full details of this significant new addition to the amateur movie field.

Dangerous Deer

The California Fish and Game Commission is conducting a campaign to point out the dangerousness of deer as pets, and to prevent over-sentimental tourists from carrying away young fawns whom they believe deserted by their mothers. "It is not safe to have full-grown deer around, especially males, where there are children", their bulletin says, "and unless there is absolute proof of the death of the mother, the fawn should be unmolested". The commission points out that it is illegal to take young deer, and asserts that in most cases the mother is nearby, with no intentions of leaving her young.

Champion Barker

The Gila Chipmunk has been nominated as the champion barker of United States by the officials of Grand Canyon National Park, as a result of his springtime activity. Actual computations reveal that he utters more than one hundred and fifty penetrating, monotonous cries per minute, and sings his song for thirty minutes at the time. Plans are under way to measure the number of foot pounds of work he does daily.

Park Naturalist Resigns

Edmund J. Sawyer, park naturalist in Yellowstone National Park, Wyoming, since 1924, has recently resigned his post, and will be succeeded by Dorr G. Yeager, park dispatches relate. During the past four years Mr. Sawyer has given great impetus to Nature work in the park, and his paintings of birds and animals, coupled with his collections, have done much to make visitors Nature-wise.

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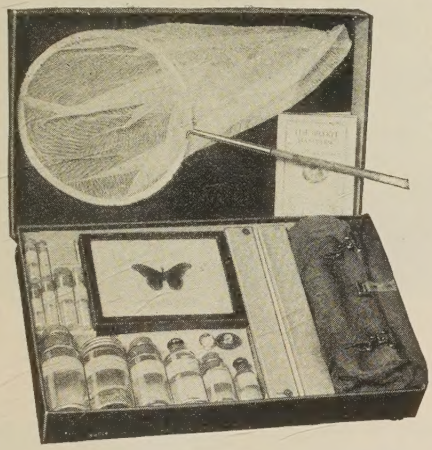

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Aiding Blind Canaries

A novel scheme for aiding a canary who was rapidly losing his sight and could not jump to his perches has been devised by George Y. Allen of Utica, New York, whose bird, nearly seventeen years old, had become quite helpless due to his blindness. Mr. Allen first tried putting the feed and water cups on the bottom of the cage, but the bird, made awkward by poor vision, spilled his water, and lost the lustre of his plumage. Finally Mr. Allen built two runways, two inches wide, with small cleats on them, to extend from the floor of the cage to two perches at either end of the cage, and placed the food and water receptacles a short distance away from each. Now the bird runs up the runways to the perches, picks his way along them until he can reach the cups, and manages satisfactorily. He no longer spends his time at the bottom of the cage, but clambers up and down, and gaining confidence with experience, jumps from perch to runways or to the floor. Despite his age, he sings occasionally, jumps about a great deal, and bathes with unction and ceremony.

Ice Age Effects

A theory that the earth has not yet completely recovered from the effects of the Great Ice Age, which warped lands like Norway and Sweden with its millions of tons of ice and snow, was developed by Dr. Fridtjof Nansen, geographer and Arctic explorer, in a lecture before the Academy of Sciences in Berlin. He believes that the surface of the earth is slightly elastic, and that as the excess weight was removed Norway and Sweden began to rise. They are still creeping upward, as are also the lands covered formerly by ice in northern America.

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IN SUMMER-TIME

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PUBLISHED BY

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To Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

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Blue Gentian—*Gentiana calycosa*

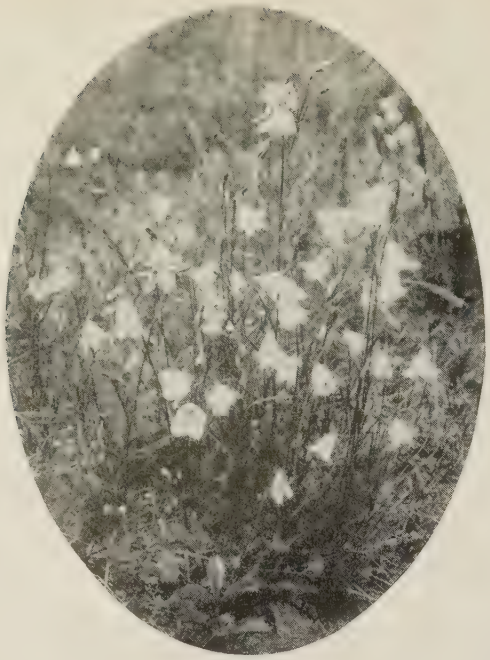
Chalice-Flower—*Pulsatilla occidentalis*

St. John's-wort—*Hypericum scouleri*

Glacier Lily—*Erythronium grandiflorum*

Butterwort—*Pinguicula vulgaris*

Fringed Parnassia—*Parnassia fimbriata*



HAREBELLS
Campanula rotundifolia

FLOWERS *of* GLACIER PARK

by Carra E. Horsfall

GLACIER National Park was a veritable garden last summer when the American Nature Association Expedition visited it. There were acres and acres of colorful blooms, many of which are quite familiar to all of us—Indian paintbrush in all its range from white through yellow and pink to the richest reds, brillant blue pentstemon, mimulus in cerise and yellow, and the lavender of showy fleabane and asters. The flowers selected for picturing are, for the most part, those of the higher altitudes up near the melting snows or in sheltered meadows.

Upon the mountains of the great northwest we find the beautiful blue gentian, a close rival to the fringed gentian of the east. In shape of bloom it resembles its relative, lacking only the fringed edges of the outspread petals. Here and there in some bit of fertile soil at the base of a sheltering rock are small patches of these lovely flowers. In open meadows above timber line they provide the intense blue color which continues to add its charm to the landscape during much of the short summer season because the plants send up many stems each of which usually contributes one bloom but may sometimes be more generous. Under unfavorable conditions dwarfed plants bear small flowers but their color is just as vivid. Normal plants are from five to ten inches in height.

Another blossom of the higher altitudes is the creamy-white chalice-flower. This is one of the curious plants which has colored sepals and no petals. Being strictly a northern variety it is more likely to be found above timber line, in the alpine zone not too far from the receding snow bank. The plant opens its chalice when the stem is quite short and the feathery leaves form a fur-like collar about it. This stem gradually elongates as the soft silky seed-heads mature and ripen. The silvery-gray color adds realism to the name Old Man of the Mountain, by which these seed clusters are commonly known.

St. Johns-wort happened to be in greatest profusion near Sperry Glacier at the season when we visited that part of the Park, though it had been seen in many other places. The brilliant red buds were conspicuous among the dense clumps of leaves and the feathery stamens formed perfect yellow puffs. The moist earth near tumbling brooks seemed a favorite place for this bit of incarnate sunshine, perhaps the more appreciated on the day when we had climbed over the pass in a driving sleet storm.

One of the most exquisite white blooms is that of the fringed parnassia. The waxy green leaves grow thickly in marshy places at nearly all altitudes and innumerable stalks stand straight and stiff to support the spread of dainty lace made by the flowers crowded together. This plant is found in bogs and along streams from Alaska through western Canada and south through Washington and Oregon into California and New Mexico. Other species are also found in similar places throughout the eastern part of United States.

Six thousand feet up in the mountains, at the edge of a wee trickling brooklet, grew a most curious plant with blooms which remind one of violets because of their color and their spurs. But the yellow green leaves lying in a flat rosette upon the ground are not at all like those of the violet. They are usually irregularly dotted all over with black spots which are not a pattern but composed of tiny insects. This is the carnivorous butterwort which sets its trap with bristly hairs and sticky glands, and perhaps some sweetness to attract its victims. They become entangled and supply the plant with some element needed in its growth. The beautiful color and form of the flower, which was found only twice on the entire trip, overbalances, however, all other considerations.

But the miracle of erythroniums pushing their leaves and golden blossoms through the snow at glacier edges can never fail to thrill the observer. They are rightly called glacier lilies for they bloom in greatest profusion where the snow has but lately covered the wet ground. Like their spotted-leafed eastern relatives,—dogtooth violets,—they are early spring flowers so are past their prime in low altitudes by the time earliest visitors arrive in the Park. However, they can at least see the tall stems topped by three-angled green capsules, like thousands of turbaned guards standing at attention on the mountain slopes.

NATURE CALENDAR

JULY

by E. Laurence Palmer

A CERTAIN July gave to the world Gilbert White, the author of "Natural History Antiquities of Selborne", the book that has inspired so many people to look further into the secrets of Nature to be found in their own back yard. Dallas Lore Sharp, who writes so interestingly for Nature Magazine, tells us in "Five Days and An Education" that the purchase of this book when he was thirteen was his "first independent investment and the most momentous investment" he ever made. He tells us that it marked the first real day of education in his life. What better recommendation do we need to inspire us to read a book? The "Naturalist's Calendar" kept by White between 1768 and 1793 at Selborne, England, lists for blooming in July the following species of plants that are to be found in America,—privet, butter and eggs, cat-tail, willow-herb, field madder, wood betony, round-leaved bellflower, wild carrot, cat-nip, tufted vetch, water hemlock, moneywort, potato, peas, common spurrey, red clover, buckwheat, sun-dew, skull-cap, water plantain, teasel and others. How many of these can you find in bloom here in America in July, 1928? In addition to these notes on plants to be seen in bloom in July, White records that about July 27 to 29 the swifts begin to disappear and that they are last seen on July 31. How does that check with conditions here? I might give you equally interesting insect notes from this source but prefer to let you read them yourself.

July is full of how and why problems. How do earthworms get into rain-barrels if they don't come down in rain? Why do we find the ground covered with diminutive toads after a July rain if the toads don't rain down? How do snails walk when they have but one foot and do not hop? Why is it worth while for many plants to be covered with sticky hairs? How does it happen that a pool of rain water may, in a comparatively short time, become populated with water life? Why do we cook fruits that we desire to can? These questions may be answered from Nature in July.

Summer camps will be in full swing during July. The sleep of young men and women may be disturbed by the prowlings of young skunks, young raccoons, young mice or, in imagination, the young and adults of much more ferocious and dangerous creatures. The first night a great horned owl or a loon is heard may be followed by a day of excitement in which the new campers may be lead to believe all sorts of absurd things by the "old timers". The hilarity may be even carried to the extent of proposing and carrying out a "snipe hunt" in which the greenhorns are left holding the bag. Camp life may prove rather hard for the credulous for a while, but if it is properly handled may result in a clean, healthy desire to know things as they are. Superstitions of all sorts concerning Nature may be handed their "walking papers" if the Nature walkers begin to make the most of their opportunities.

It is not possible for everyone to experience the joys of camp life, of course. The stay-at-homes may find that home life in Nature may make an interesting theme for the month. Not a few birds like the goldfinches are concerned almost exclusively with home duties. The mockingbirds in the south register their concern for their young with antics that make the novice believe the birds are insane; at least this is so when a cat is around. I have seen a cat with a young bird get chased far under a dark porch by a mother mockingbird who at the last moment must have had presence of mind enough to save herself. The parental care exhibited by cat-fish, by some of the gophers and by a considerable number of other forms of wild life are worthy of our attention.

Not a few of the "flying ants" are to be seen active at some time during July. Have you ever watched them shed their wings? If not try your hand at catching them in the act. Have you ever tried to determine the various means employed by ants in detecting members of their own colony? Try this in July.

The behavior of almost any of the preying insects to be found in July are worthy of observation. A digger wasp with its paralyzed prey, an ox warble fly driving a herd of cattle frantic, a mosquito upsetting the decorum of a prayer-meeting or a lady-bird beetle greedily gobbling up plant louse after plant louse hold our interest readily. On the other hand we may turn to the varied means by which insects protect themselves from their enemies. The canker worms that look so like a twig that they deceive us and birds, the pear slugs that look like nothing living, are only two of the more interesting. July is the month of luxuriant Nature splendor, the gayest time of the year. Make the most of it, for now winter, though still distant, is coming our way.

SEE ARTICLE PAGE 19

IN GLACIER NATIONAL PARK

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NATURE MAGAZINE

Volume Twelve
No. One

July, 1928

THE *LIEUTENANT* AT ANCHOR
The expedition's schooner off shore at Bizonton

When Night Comes To Water

A Nocturnal Look Beneath the Waters of the Tropics

by William Beebe

In the late afternoon of the first day of May I leaned on the rail of my schooner in Gonaives, the great gulf of Haiti, and watched the dusk shift quietly into darkness. Before the last hint of afterglow faded I worked out an idle calculation with a pencil stub on the rough wood beneath my hand and found that one hundred and fifty thousand, eight hundred and thirty days ago Christopher Columbus had watched the Haitian sun go down over these same waters. On that day his men "caught many fish like those in Castile, dace, salmon, hake, doree, pampano, mullet, conger eels, shrimp and they saw sardines",—all perhaps the *nth*-great-grandparents of the fish who had come this very day to my hooks and seines.

The earth's horizon rolled steadily upward from the edge of the glowing path of the great sun, along whose farthest rim early rays were at this moment causing Bornean cocks to crow and sleepy Dyak savages to stir. This newest night which had come to me as I stood alone on the deck of my schooner, was dark and moonless, half cloudy, half brilliant starlight. Before long I noticed that the leg of the gang-way was brilliantly illuminated,—the tide clashing into vision the latent phosphorescent cymbals of the great world of water life. Into the jet blackness of the water I threw a piece of coral,—which, bomb-like, burst into a starry radiance of sparks outside of which was a wide black area, then a broad bright ring of flame, which gradually grew larger and fainter. The lump of dead coral could be seen slowly sink-

HERE is an article by William Beebe. Need we say more, other than to express our pleasure in being able to present it to the readers of Nature Magazine? Next month Mr. Beebe takes us beneath the surface of the tropic waters,—a thrilling story, thrillingly told. Do not dare miss your August magazine

ON WATCH BY THE LIGHT
The author squatting at the gangway watching the sea life about the submerged light

ing, clad in a renewed glory of its youth as it slipped down towards its old home.

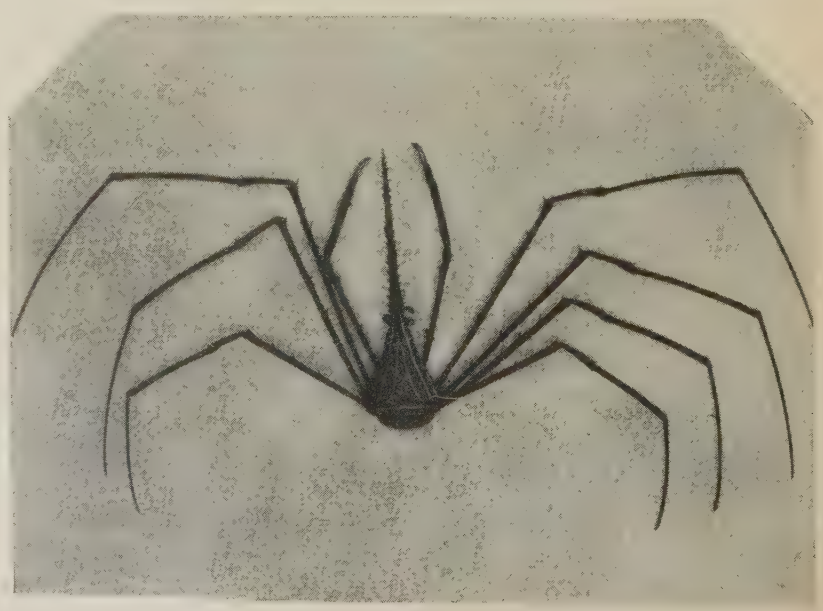
The gorgeousness of the phosphorescence drew and held my attention and I began to experiment. I sent for a shotgun and fired into the water, and in so doing I started, on downward orbit, an incandescent comet whose head was a mass of glowing shot, which drew behind a sweeping train of trembling paleness. I then threw out a bit of bent wire and reproduced for an instant the glowing filaments within an electric bulb. Finally I dropped a pin, head-first, and from my post, fifteen feet above the surface, I distinctly saw the impact—a momentary flash—a single brilliant spark which died in the very moment of birth. So abundant and omnipresent were the hosts of tiny light-giving creatures, that the blow of a pin's head was sufficient to kindle an instant's blaze.

One of those supreme five minutes followed, which at rare intervals are granted me, and leave me gasping. My eye was drawn from the tiny star of a pin-prick, up to where a great tropical firefly was zooming steadily over the water, giving out a light as even and as brilliant as those borne by the deep-sea fish, a half-mile below the surface of the open sea. With a last upward curve the flying beetle vanished and left my eyes, almost without a change of focus, fixed on the head of Scorpio, outlined against the velvety blackness of the sky. As I looked from Akrab to Antares and back again, a startling flash of lightning stabbed jaggedly across the stars from a rain cloud bearing down on us from the black mouth of the Valley of the Culde-Sac. And last of all, my eyes dropped to the thin, nicely evened line of the constellation of Port-au-Prince City along the distant horizon.

Never in my life have I seen such a succession of glorious illuminants crowded into an equal number of minutes,—the phosphorescence of life itself—the water for uncounted miles teeming with swarming hosts—all swimming dull and unseen, until some stimulus, bringing perhaps death to thousands, stirs them to momentary glory; the glowing body of the winged insect; the eternal patterns of the tropic stars; the majesty of the lightning; and the lights of the man-made city—man's handiwork seen at its best—illumined and at a distance.

Light-in-Darkness is a very wonderful theme and susceptible of endless elaboration. The fire and sun worshippers of olden times have more followers today than we imagine. The house that lacks a fire-place is like a hypnotist without his shining jewel. The man who sits with his back to a camp-fire is not normal. Incendiaries are more abundant than revivalists. Jack-light hunting is the easy sport of cowards. A candle in the window is a loadstone to more than the signalled traitor. One electric Broadway sign is worth fifty daytime advertisements. Even the three wise men were assembled and directed on their way by a single point of light.

In the glare of high noon or at any time in full daylight when I towed a net along the surface of Port-au-Prince Bay I would snare only a scattering of organisms. Fish appeared at the surface in numbers or leaped out mostly at times of stress or danger. The real abundance of life began a few fathoms down. On dark nights I would capture much more life in my tow-net, hundreds of small beings,—where by day there were tens. In the



A SPIDER CRAB
Strange things does the sea hold and this thin-shanked fellow is one of them

WATER'S EDGE AT BIZONTON
The scene of the undersea activities of the expedition in the tropical waters

moonlight there was very slim picking, the cold rays seeming to press the swimmers down to where the deeper waters sieved out the sinister lunar power.

Desirous of using every available bit of time during the four months of our stay in this wonderland of waters, I had brought with me two mighty submarine lights, of one hundred and fifty and two thousand candle-power. They were so powerful that they could not be burned in the air, but had to be sunk before we dared turn on the switch. For thirty-four nights, scattered through March and April, we kept vigil with one or the other of our lights, and watched and caught the creatures which came.

The light would be swung out gently from the deck and lowered about two feet beneath the surface. Then the great glow flashed out and with jars and nets I would walk down the gang-way ramp, and drape myself close to the water on the small platform at the foot.

There was something—some uncanny attraction—which kept me squatting on the gang-way long after the ship had gone to bed, withstanding cramps and ignoring the green moons which danced before my eyes after staring for hours toward the blazing light. As far as I could make out, the fascination was the illimitable sporting chance of new and astounding visitors. My patch of watery light was connected aquatically with the ends of the earth and the deepest depths. From my hand dabbling in the water there was direct H_2O communication with the Barrier Reef of Australia and the farthest open leads off northern Greenland,—with the jungle-stained fluid thousands of miles up the Amazon, and with the crushing blackness of the Nares Deep, five miles straight down and only 300 miles from where I watched. This geographical poetic flight would be that and nothing more if my long, patient waits were not occasionally leavened with actual amazing and unbelievable people of the sea.

When I started down the side of the schooner there was nothing overside but a world of blackness. The only sound was the lazy tide gurgling now and then around the leg of the gang-way. It took several minutes for my eyes to become accustomed to the sudden glare which tore through the dark like actual fire. I revolved the cable of the great searchlight and guyed it fast so it pointed outward. It dissolved not only the night but the water as well; as far as its rays penetrated the liquid was turned to air. The several jellyfish in sight were drifting balloons,—an occasional fish did not swim but flew on its way; when my eye caught sight of the keels of the moored boats, they appeared absurd things—suspended in mid-air, and unaccountably heaving and settling.

On succeeding nights I realized the unusual value of the first few minutes of observation, for it was then that I saw things as they normally were on the surface in the heart of the nights' darkness. I was reminded of my greatest desire—that of being able in May or September suddenly to flood the sky with an unthinkably powerful searchlight and so to see the hosts upon hosts of migrating birds—millions upon millions of them, as once I saw thousands roaring like a hail of golden bees past the torch of the Statue of Liberty. Perched on my platform I found it advisable to stare at my pocket searchlight for a time, so that the instant the

THE FILE FISH
Note the file-like or saw-like horn which gives this strange chap a name

great flare was illumined my eyes would function. I had to look quickly, for almost at once the light would begin to exercise its transcendent power.

The little zone of radiance of which I was the huddled hub became a nebula in space; the schooner was but an idea, I merely an invisible onlooker. In the pale luminescent, green ether surrounding the magic circle lay all the possibilities which ever cluster just beyond our sensory perceptions: I was one great eye.

IN THE SCHOONER'S LABORATORY TENT
Much of the work of research and classification had to be done immediately

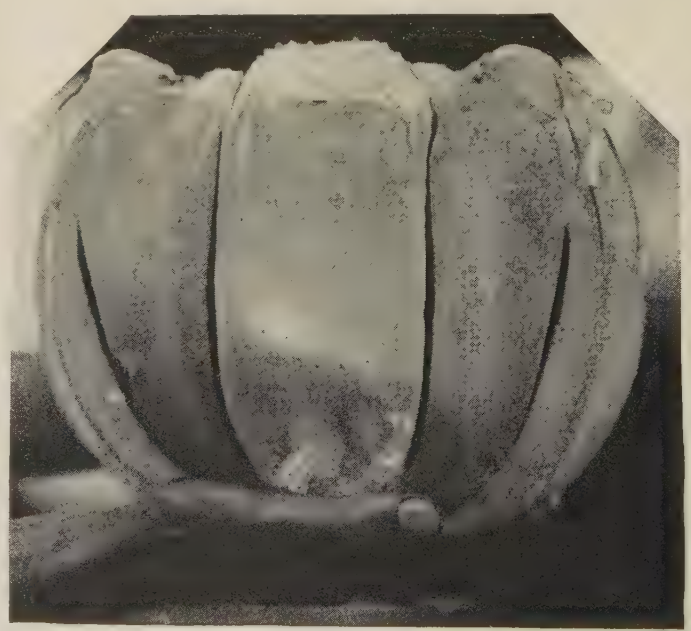
The tide was flowing gently seaward. I could count ten large, parachute-like jellies—Aurelias they were—vibrating heedlessly here and there, all drifting slowly along on the current magic of the invisible moon. This aimlessness, this passive indirectness marked them as Plankton,—πλαγκτος or Wanderers, as the Greeks have it, in sharp distinction to Nekton, the fishes who have a will of their own, a directional intention which can take them across or against tides and currents.

A glance around showed that the color of the water near the light had changed; instead of pale transparent emerald it had cooled to moonstone grayness. The heart of the nebula which had been without form and void was beginning to quicken into a nucleus. The visual magnetism had commenced its sorcery, and where only a drifting jelly or a casual fish roamed, there was now the core of a veritable cosmos. What the sun and the moon could not achieve in surface life, my little light was doing.

More jellies came sailing down-tide like an endless procession of pale moons. When they reached the light they almost vanished, so close was their body hue to that of the water. More and more gathered, and to my surprise these Wanderers, these merest Plankton, threw off their vegetative helplessness and suddenly began to assert themselves as Nekton. My light gave them character and will power so that when carried past they actually turned up current and umbrellaed their way as close to the light as possible. Dozens of others came slowly, ghostily, up from the deep and in less than a half hour the light was at the heart of a solid, heaving mass of life. It might have been some single, strange, amorphous, breathing being of the sea, rolling about at the side of the schooner, even sending out an uncanny arm toward one of the bobbing boats. There was now no chance for any other kind of life about the light, so I scooped up a pailful of the Aurelia jellies and got thirty-one of good size. I took them up to the laboratory table and switched off the searchlight. My nucleus had grown too solid too quickly.

An hour later I again went on watch. Only two Aurelias were in sight and these passed out to sea without stopping. About the light the hosts of tiny people of the sea began to color the water with such delicate subtlety that the increase in density might have been governed by an hour hand's movement,—from clarity to mistiness, from mistiness to translucence, finally to foggy opacity.

From now on, each evening and each night, there evolved a sequence of life about the light, impressive and dramatic to the highest degree, yet only dimly understandable by my dense mind and tremendous ignorance. If an observer could explain all that happened in the first hour about a searchlight such as this, he would possess the key to the populating of islands and continents, to the acute life and death struggles resulting at one time in an astonishing abundance of an apparently weak creature, and again, in the sudden wiping out of some strong and sturdy form.



SIDE VIEW OF A GIANT JELLYFISH
One of the most interesting of the inhabitants of the waters because of its habits of life and travel

As in a hay infusion, there was definite sequence and irrevocable shift and change. After days and weeks of peering with my coarse human sight and insight I began to detect a hint of the wheels within wheels. Most of the forms first to appear—copepods and other minute crustacea—were attracted by the sheer impelling force of the light. They were like the lovers

of open fires, and of electric signs, and of "things that gleam and draw". But when the water became milky with these, then the secondary line of visitors appeared. They were camp-followers like the vultures and eagles which wing close upon the heels of flocks and herds. To them the charm of the light was less than the urge for food.

While every one of the great phyla of animal life came, at one time or another, to my light, yet as I look back on the whole experience, there were three which dominated in numbers and conspicuousness,—the jellies, worms and fish.

TENTING ON THE SCHOONER'S DECK

It was better sleeping and living here than in the tropical heat below decks

Whenever the slowly vibrating hosts of pale, blue-white Aurelias were about, more delicate jellies came lightward, little quadrangular oblong boxes trailing four medusa tentacles behind. The first time I saw them, a trio came surging toward me. The water was clear and very little life had collected. They moved with sudden vigorous jerks more fitting bone and muscle than flabby jelly and they bumped against the wire mesh of the guard of the searchlight. Suddenly a trick was performed. No fish had swum within sight and yet there were two fish before me. I swung my net at them and both might have dissolved into the transparent liquid as far as results and my vision were concerned. I thought that the glare had overstrained my eyes and then I caught a momentary glimpse of a jellyfish in silhouette against the light—I saw a small, curled-up object in the heart of its body and there stared out at me, dimly through the filmy tissues, an open silvery eye. I had resolved the trick and with one dip of a big glass jar I gently maelstromed the jelly into my possession. In the laboratory light I saw plainly the two fish within,—one pressed tightly against the wall of its padded compartment, the other turning slowly on its own axis.

How such a habit could ever have been inaugurated and established is inconceivable, yet it proved to be one of the commonest phenomena of the ensuing nights about my sunken light.

The jelly is the one known as *Tamoya haplonema* and has no common name, and we know nothing of its life-history. The fish is the well known Bumper or *Chloroscombrus chrysurus*. Night after night, the little balloons with their strange cargo would come and go. These jellies were made of well-knit stuff, four-sided, so that I called them the Quads, and they had four sets of six eyes—if that name is deserved by a series of convex lenses which do little more than sort out light from darkness. Their creamy-white forms sailed along singly or in twos and threes. On rare nights twenty would be in sight together, and about one in every four had fish for passengers. The size of these was very accurately adapted to their jelly transport,—small Quads had half-inchers, while big, four-inch jellies might carry a few two-inch fish, or as many as twelve of the smaller size. Twisting and wriggling about in the wake of the jellyfish were four slender, pink tentacles, ready at a touch to shoot one's hand full of nettles. It was exciting to see the fish manoeuver for a few seconds before they dashed in to safety between the tentacles. It was like running into an open door before which was suspended a cluster of swaying, twisting live wires. I saw four of these fish which were killed by the nettle lariats, three of them already drawn well inside the mouth. The fourth I saw caught, and after a terrific jerking it managed to snap free, but sank dying in the water.

A JELLYFISH EN ROUTE

They came to the submarine light and performed at eating and killing in a most satisfactory and entertaining way

Much has been written concerning the mutual advantages of such a relationship, but there seems little doubt to me that the jelly,—which is very close to the bottom of the evolutionary tree,—knows nothing whatever of the affair. Between its stomach and egg pouches, within its umbrella,—is a generous space open to the water, and this the fish uses as sanctuary from the host of dangers which ever and always threaten.

The Quad probably does not even know of the fishes' presence until one of them ineptly bumps against the hair-trigger of its nettle batteries, and affords it a hearty meal. The fish, on their side, have received, as part of their heritage, an instinctive knowledge of this balloon home. The first time an infant Bumper sees a Quad it is probably as natural for him to dodge the tentacles and dart within as it is for an incubator chick to peck at a bit of food. All this we can coldly analyze and apprehend, but when from a Quad measuring two by four inches, there pours forth no fewer than a dozen healthy little fish which must have been packed together like sardines in a tin, we must stop to give an incredulous, unscientific gasp of wonder.

On one of the early days of the expedition I was called to look at a huge Cyanea jelly drifting past. Armed with a pail I rowed after it in a boat, but was helpless to do more than ladle it about. It was several feet in diameter and quite too enormous to dip up more than a fraction at a time. I secured many small Bumpers and lost so many that I estimated that there must have been several hundred at least.

Every night I caught sight of other jellyfish, waving their exquisite little transparent umbrellas, and there were ctenophores, shaped exactly like Fourth of July paper balloons, with rows of shining cilia,—all appearing more solid and weighty in their shadows than in themselves.

Free-swimming seaworms have never carried as deep an appeal for me as many other groups of animals. Many of them sting rather badly, and they do not enjoy being studied quietly in aquariums. Whatever interesting habits they may have are usually confined to their tunnels and burrows. But here at my light I had to pay attention to worms or shut off the light. They never failed to come,—sometimes, as on the night of March thirty-first, in many thousands. Some were pink with white heads, others had a series of green scales down the sides; tiny thread-like chaps sent out an astonishingly powerful green phosphorescent light, and a gray worm with a black cap was one of the fastest swimming creatures I have ever seen—a veritable vermiform electron. Some moved so straight and steadily that they might have been propelled by a tiny turbine, but most travelled by frantic wiggling. The energy developed before my eyes every night in transforming this host of worms into futile activity, would, if laid end to end—but complete it yourself. Besides it was far from futile for the worms; it was the most important evening of their whole existence.

A PUFFER FISH INFLATED

(Below) Seining the sulphur lagoons of Source Matelas for what they might hold

The most abundant form was pink, two to four inches in length, and bore the name of *Nereis glandulata*. Its numbers sometimes formed a maze of wriggling color about the light. I found that the paler pink individuals were females. Late on the twenty-seventh of April when other forms of life were scarce I picked out an unusually large female worm and watched her. Up from the depths she came, and then worked in from the outer ring of darkness, forging steadily along, rowed by bunched oars, so small and swift that they seemed like a narrow, hazy band down each side of the body. When she reached the light she shot past, then turned and returned, and moved in and out among the mass of fish and worms, small jellies and shrimps. Soon she began to describe large circles several feet across, swimming now fast, now slow, then came close to my seat on the gang-way and threw a fit; at least no less vulgar, more accurate term came to mind at the moment. She stopped her headlong course and circled dizzily around and around in her own length.

At once the water of her little whirlpool became cloudy, then milky, then the worm swam a foot or two farther along, and, like a smoke-writing plane in the sky, established a new zone of paleness, and repeated this a third time. Meanwhile two worms of a lighter pink had shot in their erratic orbits across the first area. A shock of electricity could have been no more instantaneous, and if we estimated the egg-laying speed and energy of the female at five, we must rate the gyrations and whirlings of the male dervish worms at twenty. The cloud they scattered was less noticeable, but they went from one to the other of the spawn zones in a fine frenzy of fertilization, the female being still busy with a fourth area, but moving with diminished speed. She soon passed out of sight forever.

With empty mason jar I dipped up as much as possible of the first cloud together with one of the males, and cached it safely beside me. The other male had just discovered the third ovarian cloud, and showed no slack-

ening of his activity, when there came a swift finalé. A small Quad jelly swam directly through the mist of worm eggs and the male in a blind rush collided fairly with a coiling tentacle. As abruptly as the presence of the eggs had affected him to frenzy of movement, so this casual touch brought complete paralysis. A third male who had just sensed the eggs swam in his very first circling against another tentacle, and off went the unconscious Quad dragging with infinite difficulty the heavy, dangling bodies of the pink worms. So much of a burden were they that for several minutes the jelly could make no headway and only jerked about in irregular circles.

At the end of the evening I went up to the laboratory and spent an hour or two watching what, to me, is one of the most dramatic things in the world—whether in the ovum of frog or worm. This is the slow, almost eclipse-like creeping across the face of the fertilized egg, of the crease marking the first division into two cells, then four, eight, sixteen, and so on. And I was sorry I had spoken in a derogatory way of sea-worms, for they had taken me wholly outside myself for an hour and permitted me to witness life, birth and death, and a concentration of energy and enthusiasm which put to shame any of my half-hearted attempts at mere description.

We have a literary catch-phrase,—"he was transfigured with emotion"—which may be applied most literally to these nereid worms of the sea. I sent a bottle of several to an eminent authority and he said at first it was quite impossible to identify them for they were in full breeding condition—known as the heteronereis phase. To a non-annelidist, it sounded like being unable to recognize a peacock because it had a train, or a tanager when it assumed its scarlet body plumage. Eventually, with consummate skill, by dissecting out the jaws, the professor to whom I had applied was able to call it *Nereis glandulata*. It is an astonishing fact that when full-grown but still living in crevices or tubes on the sea-bottom, these worms have many generalized characters by which they can easily be recognized, but at the approach of the free-swimming, breeding season, structure after structure changes, appendages, skin covering, tentacles, eyes—everything except the concealed jaws.

I think the most constant feature of fish life about the light was youngsters of many species travelling singly. The surface of the water in the darkness of night and in the open bay must offer many advantages and relatively few dangers to fish of the nursery age. From one-third of an inch up to two inches was the general size of the orphans and the total list of species would be a long one. They came slowly, but increased in numbers steadily throughout the duration of illumination. Many left after a brief circling, or a period of motionless balancing, staring head-on at the glare. Diminutive triggerfish treaded water with their bodies curled up, the tail fin pointing almost forward. Both shore and reef fish were represented, but half-beaks, puffers and triggers shared equally in abundance.

Within the first hour of observation I saw and captured several of the strange, transparent fish larvae called Leptocephalids. I have told elsewhere the remarkable history of the leptocephalus of the common eel, and of the probable larvae of tarpons. Every night I caught and studied as many as possible, a total of several hundred. Many showed characters relating them to unknown species of eels, but others were unquestionably the young of ladyfish, *Abula vulpes*. There were none of the common eel, nor of the tarpons. I was interested in a six-spotted, rather rounded, opaque type of larvae and found that it was an undeveloped lizardfish, *Synodus foetens*. Closely resembling this was a small species of anchovy which was usually seen singly, but on the night of March twenty-eighth appeared in several schools of five to eight thousand. Their whole actions and manner were totally unlike the isolated individuals. They moved with perfect synchronization, although raked again and again by marauding herring and voracious jacks. Often the school drew out into an oval but usually the formation was an almost perfect sphere, moving swiftly forward until those in front touched the light, when the thousands would turn as one fish and roll away.

Close upon the arrival of the small fish each night, came the larger predaceous forms, schools of herrings which kept well down, flashing up now and then to seize a victim. By the fifth night I had to fight for my specimens. A school of eleven big-eyed jacks, *Caranx latus*, had established itself beneath the hull of the schooner, and as soon as the submerged light was turned on, they hunted along that side from stem to stern. The third night they had become so bold that they got fish long before I could reach them with the scoop net. I threw them a hook, caught one, and all the rest vanished. So this was my procedure every night: the moment they appeared I hooked one, and let him dash about madly, lifting him and dropping him back, until the fright was thoroughly imparted to the school, when all its fellows promptly disappeared. When the original eleven had dwindled night by night to six, I examined the food of one I caught and found thirty-three fish,—fourteen anchovies, six lizardfish, six triggers, two puffers, five bumpers and one *Bregmaceros*. It was curious to observe that none of the predatory fish ever touched a worm or a true leptocephalus larva; these had only the tentacles of the jellyfish to fear.

The *Bregmaceros* was one of the rarest visitors from the open or the deep sea whose presence was wholly unexpected. I had taken it on the *Arcturus* at a depth of three-quarters of a mile, and yet here came a half dozen to the surface and scarcely a hundred yards from shore.

We have only begun to learn something of this strange world and can never foretell what the next moment will reveal. Three times I saw very small flounders come to the light, all of which I caught. The first was a young turbot, *Syacium micrurum*, absolutely transparent except for the tin foil backing of the eyes and a few red blood pigment cells in the gills. The others were fully pigmented when they first appeared. In the light one of them lost all color except for a greenish border. It undulated to the surface, curved down into a saucer or cup-shape, with the circular fin rays above the water, and floated until I captured it. It later repeated this in an aquarium, floating quietly for an hour. The fully expanded fins apparently made such intimate contact with the surface film that, like a vacuum cup, it remained suspended.

Equally unexpected visitors, which like the flounders, seem wholly adapted for bottom living, were little sea-bats, *Halieutichthys*. They came up from the black

depths with turquoise blue fins wide spread, and the only organ of propulsion the tail. With the slightest lateral movement they kept balanced in one spot or forged ahead, and thus remained at the surface with the least possible expenditure of energy.

The lesser people of the night—the true Plankton—need a volume to themselves. Night after night I watched the minute swimming hosts collect about the light—month after month—indeed turning the water to a pale soup of vitality. I had given little thought to their real mission in life. As I have narrated, I had observed battle and sudden death, feeding and being fed upon, courtship and mating. And then I would put out the lights and lower the curtain upon human perception of all this maelstrom of activity. One day I made a deep record dive from the gang-way, full ten fathoms down. It was an experience of tremendous interest, but as usual in many of my efforts, one of the most startling things was as unexpected as it was obvious,—the shaggy growths upon the hull of the schooner. The Captain, I learned, knew all about it and considered it as unpleasant as we found it exciting.

This growth below the water line was much less dense on the port side beneath the gang-way than on the starboard. The Captain explained this as due to the fact that when lying at dock in New York City the ice jammed and scraped against the port side, removing much of the protecting copper paint. Two additional reasons, it seemed to me, were that the starboard was usually the lee side, and also got more sunlight.

At any rate, near the gang-way there were several inches of sea-weed, and forests of hydroids, with here and there flattish, deep-red organisms, colonies of *Botryllus*-like ascidians, each individual delicately outlined with bluish-white.

On the other side of the schooner there was much red, hairy algae and scattered through it, like partridges in tall grass, a diversity of creatures: jet black tunicates, *Phallinia nigra* and others deeply tinged with rose, some of them three inches in height; occasional goose barnacles, with deep red stems, white shells picked out with pale yellow and deep purple appendages. Here I found geranium red tunicate colonies, sessile barnacles, and a host of winged, pecten-like bivalves. Walking about were numerous sponge crabs, mostly covered with hairy, red algae, and clinging very tightly to what they walked upon.

Whenever we felt the need of a humorous touch in science, it sufficed to pry loose several of these crabs and put them on view in an aquarium. Within a few seconds after regaining their balance they would cling together as closely as the proverbial burr or tar baby, and would begin to filch sea-weed from one another and landscape garden themselves. With eyes comically raised they would reach out with their claws, feel among the growths on the back of one of their fellows and pluck a bit of weed. The broken end was then placed in their mouths probably to moisten it with a sticky secretion, and it was then solemnly planted on some shady portion of their anatomy where the crop was not doing so well. The comedy of it was only enhanced by the seriousness of the operation,—creatures with no means of defence, endeavouring to efface themselves by transplanting sea-weed, sponges, sea-anemones, anything which they could move and which would take root on the hard rough surface of their body.

A few weeks before, I had seen the swimming host of these selfsame barnacles, tunicates and crabs scuttling about the submerged light, and now they had staked their all of life by settling down on this ready-made surface in mid-water. Here was a fascinating half-way house between the eggs and the larvae and young in various free-swimming stages, and the centuries-old permanent coral reef itself, fathoms down, on the bottom of the bay.

I have material for a half dozen technical papers on the ecology of these relationships. In this article I have tried to present only a few high-lights, which, after all, are partly dimmed by the shadows of ignorance.

The last night of my stay I worked and watched on the gang-way until I could drive my muscles and eyes no longer, then switched off the light and went to my tent. At midnight, in the blackest darkness, I turned on the light again for a single instant, and there were the multitudes still milling about,—searching, fleeing, fighting, mating. And I tried to imagine the centuries and millenniums that this had been going on before Haiti ever rose above the waters; and my mind went ahead to the ages when it would still be in full sway, eons after the last human being had completed his span of life, and I gave it all up. But I knew that as long as I could strive to take in the sweep and swing, the warp and woof of things, cosmically and universally, I need fear no touch of conceit for anything I might ever achieve in this world.

THE AUGUST ISSUE

FOR THE *frontispiece of the August issue, Mr. Horsfall has painted a remarkable undersea picture to illustrate the second article on sea life by William Beebe.*

One of the most popular and widely used articles in the recent issues of Nature Magazine was that by Dr. Albert A. Hansen on keeping the weeds out of the lawn. Making of lawns, however, is a late summer task, and the August issue will contain a remarkably valuable article by O. B. Fitts, Lawn Specialist of the U. S. Department of Agriculture, on how to make your lawn, how to care for it, what grass to select and many other details.

A. B. Champlain will tell his story of the Bee in the August number. It is a remarkable story. Alexander Sprunt, Jr., writes of the extinct Labrador Duck. Tom Gill takes us flying over forest areas. Stephen Haweis lets us in on the mental processes of Fisi, the Hyena. Gayle Pickwell writes delightfully of America's Lark, the Horned Lark.

CLARK CROWS WERE SEEN
(Below) A mule deer doe walked right into our circle about the camp fire and made friends of us all

MRS. BRUIN A CALLER
Having shared the rights to the refuse from the ranger's cabin, she thought she knew all about men

BANDITS *of the* BORDER

Some More Thrills of the Glacier Park Expedition

by Arthur Newton Pack

Photographs by William L. Finley and the Author

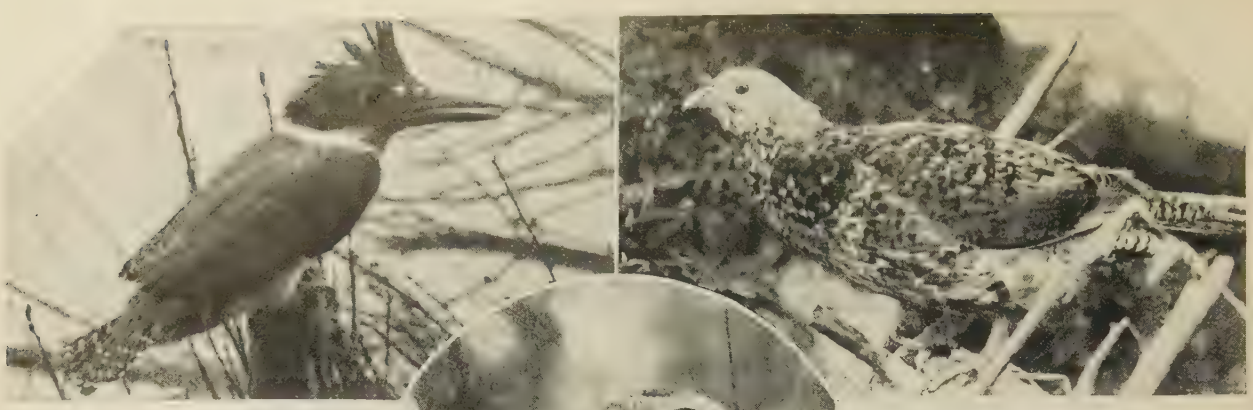
"SAY! You Nature hounds are too gol-darned popular with the animals around here anyhow", growled Vic. "For Pete's sake, if you want to coax 'em close, *do* it, but tell the next bear that wants to come into my cook tent at two a. m. and walk all over my map that I'll give him a Gene Tunney on the nose that'll make him look like a new variety that ain't never been discovered yet".

Western custom decrees that the cook of a pack outfit is fully responsible for all the provisions. He spreads his bedroll among the boxes, sacks, and panniers and presumably even falls asleep with a nice fat ham for a pillow. Then, if marauders come, it's his war and he can fight it all alone unless assistance really seems necessary to avoid someone's getting hurt. Not being the cook myself, I thought this a very proper arrangement; but even at that it occasionally gave me a funny prickly feeling to be awakened in the night within the doubtful protection of a thin canvas tepee by a snort and crash as Vic, having exhausted the supply of wood billets by his pillow, heaved a kettle or some other utensil at a particularly persistent bear. Then one night at Waterton Lake Ranger Station, which was the favorite rallying point of the bears, old Brownie stole the "spotted pup" (elsewhere known as rice pudding), and retreated with it to a dead tree immediately behind the tepee which Mrs. Pack and I shared. A black bear, having failed in his original plan of getting the sweet for himself, thereupon set out to hi-jack the

This fourth article based on the American Nature Association's Expedition to photograph mountain goats and pronghorn antelopes recounts some of the incidental experiences of the party in Glacier National Park.

THE FRONTISPIECE

The frontispiece of this issue is from the brush of R. Bruce Horsfall, Nature Magazine's artist, and is the view from camp just below Brown's Pass. The camp was set up in the midst of a flower-decked mountain meadow with its brooks running joyously down from the bases of semi-glacial snow-banks. There was a glimpse of Lake Bowman in the distance and many rugged peaks against a background of sunny skies or clouds. Add to this stately beauty the grace of moving animals whose curiosity and friendliness brought them near to members of the expedition, and those other elusive ones who remained high up on the crags, and you can visualize the daily gallery. The deer were especially fond of the tips of long elk grass blossoms, nipping them off with dainty precision and munching them at leisure. It was from this camp that the expedition made its trail over the snow-covered Boulder Pass, and the photographers climbed to the haunts of mountain goats, far above.



A KINGFISHER WAS FOUND
(Right) We also spotted a sparrow hawk and managed to get a good picture of it

GROUSE WERE DISCOVERED
The expedition found much bird life in various parts of Glacier National Park

successful marauder and a fight ensued, punctuated by crashings of the kettle which were not conducive to sleep.

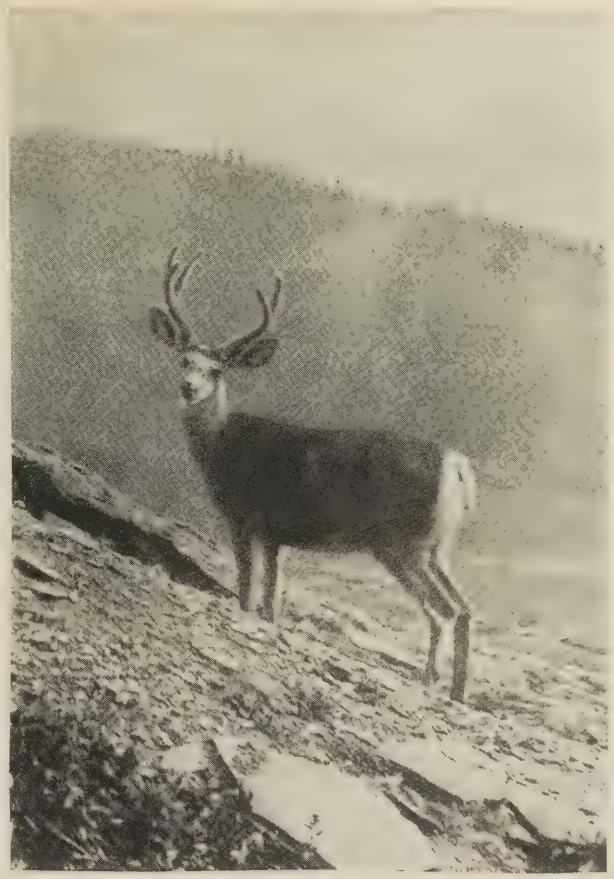
Next morning I sallied forth to the lake, intent upon catching a few fish for breakfast, but the inflated rubber boat—left on the beach the night before—lay a little distance away, nothing but a limp, crumpled mass. Jim came up. "Well, look at that"! he ejaculated. "If that fool bear didn't go and turn it over to see whether it was good to eat and then give it a wallop to express his disappointment". There in the side were three deep claw marks, one of which had operated like the roadside nail in the automobile tire and made a nasty jagged hole. We produced an emergency tire repair outfit and set to work. Unfortunately, Mr. Kelly of Springfield, or whoever it was, never figured on bears' c l a w s, and the p a t c h e s weren't large enough. Consequently, the rest of our explorations via rubber boat were of short duration, it being necessary to land every ten minutes and get out the pump for a little more "Walter Camp" exercise.

Brownie, the largest of the Waterton Lake bears, was at times a comedian. She would sit at the edge of camp, just beyond range of any unwelcome missiles, balance on her haunches and rythmically comb the long hair on her tummy with those long curved claws. Having shared the rights to the refuse from the Park ranger's cabin for a long time, she thought that she knew all about men. For example, she knew that Tom, the ranger, meant business; but that most visitors and tourists taking the north circle trip would leave her strictly alone if she charged in their direction and said "Woof"! One day when Bill Finley had followed her with his movie camera a little distance from camp she tried it on him; but Bill knew a thing or two. In the first place he knew that if she was really a bad bear and he turned to run she could easily run faster; and in the second place he knew that black bears are the greatest bluffers in the world. The bear came on straight towards him. Bill stood perfectly still. At ten feet she rose on her hind legs, waving her paws, and let loose her best "Woof"! The man never moved. Her bag of tricks was exhausted and Brownie suddenly remembered that she had business a little way off. She dropped on all fours and ambled slowly into the woods at one side,—not, however, with any pleasant expression on

(Below) DID WE COME UP THAT?
One of the mountain trails that was followed by the Expedition

her face. Jim Whilt vowed that Finley had plenty of nerve and was "kind of foolish" to take such chances; but then Bill says that's his business. He can have it.

A day or so later we broke camp and headed up the western trail past Lake Janet and Lake Francis, where a marvelous waterfall pitched down from Dixon Glacier. Continuous travel through the woods became monotonous as there were infrequent views and no animals to be seen except a few porcupines. Unquestionably the country was full of deer and bear, but they could see us coming long before we could see them. Thus we were glad when the switchbacks began to unfold in the climb up Brown's Pass, even though heavy clouds, persisting with the east wind, practically excluded the view of Logan Glacier. Oh, how cold it was when we reached the top of the pass! There was no sign of the pack train, which had been late in starting; no refuge from the drizzling rain, and no prospect of anything better until Lyle, our head packer, should catch up with us and we could have a council of war. The combined lung power of every one in the party at last coaxed wet twigs into a reviving blaze, and our lunch disappeared almost as soon as the bags were opened.



HORNS STILL IN THE VELVET
The bucks were not quite so tame as the does and yearlings

Just when prospects of photographic or artistic work seemed lowest two large ears appeared over the top of some stunted firs a few yards away and with the most casual unconcern a mule deer doe walked right into our circle. Two fawns bounded across the trail and hid in the dense thicket of evergreens. They jumped along in peculiar stiff rhythm as if worked by hidden strings in a Punch and Judy theater. Emma—as we promptly dubbed her—was the most perfect subject any photographer could ask for. My movie camera had jammed as a result of the constant jogging of the horse and had to be laboriously opened and doctored up within a loading bag, but Emma simply looked on and waited. She apparently did not know fear of man, and her curiosity was greater than anything else. Somehow one of her great mule ears had been torn and we at first thought that she might have been raised as a pet. However, our subsequent experiences with deer in this region indicated that they were all remarkably tame. After many feet of film had been exposed, I wanted to get a slow motion picture of her

THE BEAR SAID "WOOF"
But Bill Finley knows bears and figured,—rightly,—that it was all a game of bluff

EMMA HAD NO FEAR
She had no intention of running away, feeling that the range was hers, not ours

bounding away, but that was the last thing which Emma had any intention of doing. Her idea of motion was to look sadly at the gesticulating human beings who would drive her away and then to lie down and peacefully chew her cud. Clearly she indicated that this was her range and not ours and she intended to do just as she pleased.

RIDING ALONG THE RIM

Going through Boulder Pass the trail followed the rim of a glacial moraine

Before we knew it the pack train came scrambling up the trail with a chorus of "Hike, you!" and "Move, you — — pack horse", and with the pack train came the rain in earnest. Something was said of a camping site just below and a bedraggled party moved on down the trail, but where was the camp site? We crossed a patch of snow and ice and Mrs. Pack's horse slid down with a crash, pinching the rider's leg. Fortunately, there was no serious damage and horse and rider got up together, shaking off the snow. The guides all began to look for the camp site, pack horses began to wander and the rain came harder than ever. Some one shouted to leave the trail and head up the slope, and what a scramble there was with horses slipping and sliding and the wet alpine firs tearing our slickers. This was a new country even to Jim. At length we came out on a flat, white with dripping spires of bear grass still in full bloom. Thank goodness there were some old tent and tepee poles left by the party which had cut the trail a couple of years ago. The cook tent went up and soon the tepees followed, but the whole outfit was thoroughly soaked. All night long waterfalls thundered and their music mingled with the howling wind to create a sound like breakers on a rocky coast.

The east wind flung the rain against our tepees in rattling gusts well into the morning, but the camp still slept. It was after eight before Vic's welcome "Come and get it" rang out, but no one had been awake long enough to be hungry. Melvin ruefully displayed a half-eaten pair of chaps which a raiding porcupine had left for another meal and Vic told of two large bucks and a doe which he had seen outside the cook tent. The rain let up after breakfast and a party set out to explore the trail up over Boulder with Lyle and Jack as advance guard, armed with axes for cutting the ice. Mrs. Pack borrowed a pair of chaps from Vic for additional warmth and, encumbered therewith, discovered the reason for the cowboys' peculiar walk.

Rounding the shoulder of the mountain immediately above camp, we looked out across the most magnificent cirque we had ever seen. Fourteen waterfalls pitched down the face in white ribbons of spray, while one in the center appeared to spurt out of the wall, giving no indication of higher origin. This we learned was Hole-in-the-Wall Falls. To the left, down a precipitous valley, we glimpsed Bowman Lake and across the cirque rose icy Boulder Glacier, its top still obscured in misty clouds. Beyond this lay our destination. As we slowly rounded the cirque, splashing almost under one of the waterfalls and wading countless streams which paused a moment on the narrow ledge of the trail, we presently came to a halt while the boys swung their axes to cut a foothold in a steep snow slide. We could not ride across, but drove the horses before us. Jim's horse stepped off the edge, but, as he managed to keep on all four legs, missed the swift trip to eternity below. There were several such pauses for trail cutting and at length we came out upon a pile of bare rocks among which little piles of stones marked the way. At the very edge of Boulder Glacier a tiny lake of green water supported a floating mass of ice. Far down below us we saw Brown's Pass and a patch of snow which we knew lay close to camp. We seemed on the very edge of space, treading twisted seams of lava rock and splashing continually across a thousand rushing streamlets. Snow lay in every pocket, but where the surface was approximately level our horses

GUNSIGHT LAKE, GLACIER NATIONAL PARK

One of the camp sites selected by the American Nature Association Expedition

could cross it in safety. As we stood at the foot of the glacier we looked across at Boulder Peak rising almost perpendicularly, and tantalizingly near a goat browsed from ledge to ledge, in complete inaccessibility—tantalizingly near indeed, but out of range of our strongest lens.

The trail avoided the ice bank and came out along the narrow ridge of a great moraine at the very summit of the pass. Ahead of us lay strange mountains, Gardner Peak and Glacier, turrets of yellow, with row upon row of bristling blue peaks splashed with snow and vanishing in the clouds. The last part of the way we drove the horses before us, as the snow had been treacherous, undermined with rushing streams. We made noon camp in a clump of larches where the light green sprays gave pleasing contrast among the darker-hued spruces. Jim's horse again decided to strike out for himself and, like a brainless chicken, left the trail only to flounder helplessly on the slippery snowslide. The rest of us held our breath when we looked down and saw where he would land if he persisted in his foolishness, but Jim's shouts saved the day and the horse finally followed his master's voice back to safety. Smoke rose from a clump of soft green larches where the boys ahead of us had prepared a roaring fire. Our lagging footsteps quickened at the sight and we were soon huddled around the warmth and munching contentedly on our midday meal.

From the edge of a precipitous rock beyond the larches, Kintla Lake marked in deep blue the bottom of the trail. "How far do you think it is to the end of the lake"? asked Jim.

"About five miles over and twenty-seven miles down", I replied, for it certainly looked it. Jim said that the trail was really about nine miles.

The trip back was hard on Lyle and Melvin, who had to become moving picture actors and perform on every snow slide and dangerous looking spot. They didn't mind the performing, but the wind was cold and laden with the promise of more rain, and Bill and I were always having to change film or demanding that the pack horse be unloaded at some particularly awkward place. At last the desire of the photographers became sated, or at least the rain discouraged their further efforts. Lyle beat all records back to camp, and the rest of us followed steadily until Bill sighted what he thought was an elk and I encountered a yearling buck deer. The deer was willing to be photographed, but Bill lost his footing on the hillside almost on top of his elk and gave the animal such a scare that Bill had only time to discover that it was no elk at all, but an old mule deer buck with about ten points, the largest one he had ever seen.

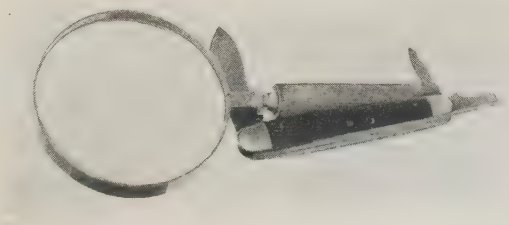
When we returned to camp Betty and Vic recorded that several deer had been around camp most of the day and that they too had seen the big buck. In fact, just as it grew too dark for good photographing, our friend Emma, the yearling buck and a smaller doe all appeared in the very middle of camp. Emma first found the pan of salt, but the buck asserted the superior rights of the male and a family quarrel was enacted for our benefit. When the buck struck out with his fore feet, Emma decided that she preferred the grass on the other side of the creek. It was curious to see them lick at the salt and then massage their faces with their tongues. No one could ever ask for a better chance to observe wild deer.

Just as we were about to turn in, Porky came back for the rest of Melvin's chaps. He meandered unconcernedly up to the wood pile and for the first time became aware of an unfriendly reception committee. Every owner of a pair of chaps or a saddle was there and ready. Porky did not get his supper that night. He left fast.

A Helping Hand

by Frank W. Bentley, Jr.

MANY are the times when the field naturalist or the Nature student has suddenly discovered that two hands are not enough, especially when he has tried to hold a magnifying glass with one of them, while seeking to penetrate the mysteries of some specimen by turning it over with the other. A simple, yet useful device, however, will save not only temper, time, and specimen, but will leave both hands free for work. It consists of a three-bladed jack-knife, and a soft bit of wood or a crack. Open the blades, support the glass with two, and arrange to suit by sticking the knife in the wood at the desired angle. Much better is this arrangement than having someone hold it for you, too, for it "stays put" just where you want it. In addition to this, it asks no distracting questions, and tells no enervating jokes.



EVER RESTLESS
Are the creeping wavelets, which move by their numbers the sand

SHIFTING

by R. S. Patton
United States Coast and Geodetic Survey

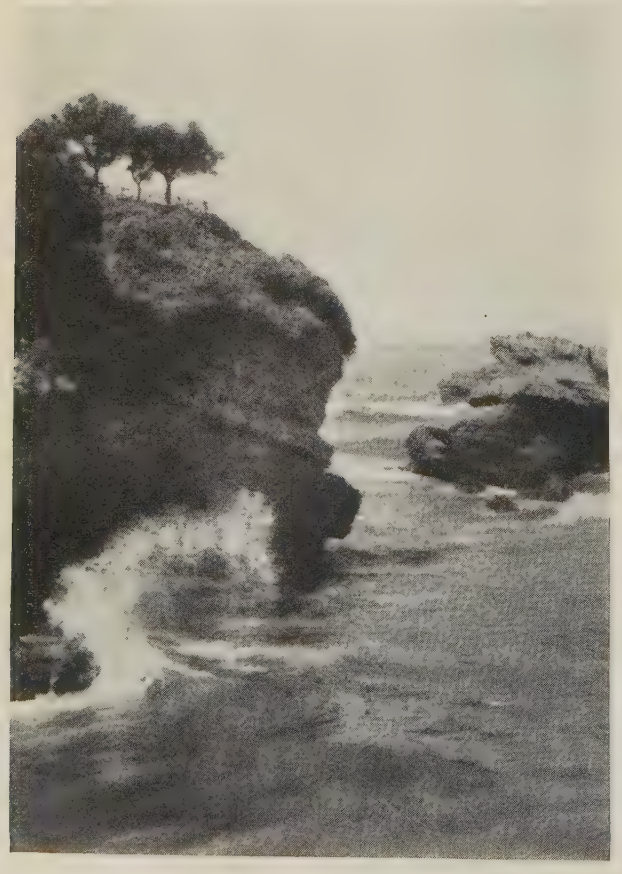
Photographs by H. Armstrong Roberts

HAVE YOU ever stood on a beach, during a hot summer day, and let the tiny curling waves of the incoming tide slide with faint sloshing sound past your ankles? They ride their foam-flecked crests landwards, they slatter out on the smooth surface, and as they start their coy retreat, you can feel the sands of the beach fleeing with them, and the hard particles prickling slightly as they pass on their way to the sea. And you probably thought, as you viewed the restless, moaning ocean, and as your feet sank slowly into the cool, water-filled sand, of waves breaking on thousands of beaches, of millions of particles ever moving—of long ages of shifting sands.

Not always do the waters roll in gently. Huge combers, driven by the fury of a winter gale, pound and roar on the sands. Swift undertows laden with pulverized particles sweep outward like rapid-running rivers. Never is there peace. From year to year, and sometimes from day to day, the beaches shift and move at the demands of the sea. It is only the hard resistant rocks such as are made of New England granite that withstand the endless shock, and even they hollow out, grow jagged, and perhaps crack as the years roll by.

Some of the changes are startling to those who are accustomed to think of the sea and land as unchanging in their relations. A month ago a middle-aged man said that his father had raised corn at a spot now five hundred yards from the shore, where ships pass in safety. More than one populous community has sunk like Atlantis deep beneath the waves.

This eternal attack of the ocean has been the principal agency in determining the present form of the shore line along the greater part of our Atlantic and Gulf coasts. Ages ago, the lands along the central Eastern seaboard were much higher above the waters than they are today. During the passing eons the lands gradually sank, and the ocean crept farther and farther inland; it reached up the rivers, and spread over the adjacent lowlands; only the highest points remained exposed. We can still trace across the ocean floor the course of former rivers. Navigators' charts reveal the lost bed of the Hudson River, which makes a deep cut out through New York Bay and far to sea across the continental shelf. Chesapeake and Delaware Bays are drowned river valleys, and the lagoons along the New Jersey, Maryland and Virginia coasts and the Carolina sounds are the works of greedy waters, sweeping in over low areas and breaking down all opposing barriers.



ROCK-BOUND COAST
Even the changeless granite must yield and crack under the ceaseless pound of the attacking sea

RENEWED HEALTH
Do the beaches promise, and new millions come with summer months

SANDS

Now Here, Now There, As The Ocean Waves Decree

The sinking of the land produced a very irregular shoreline, which is now only partially represented by the landward edges of the lagoons and sounds. For waves and currents immediately began their work of reshaping both the shores and the newly submerged sea bottom. Promontories, like enemy citadels, were cut back rapidly by the encircling attack of the restless waters; to the seaward, the breaking waves stirred up the sand and piled it into ridges, then gradually pushed their creations toward the land, heaping them higher until they emerged above the surface. Thus were born the beaches of our Atlantic and Gulf coasts. The lagoons behind these barriers slowly filled with the growth of marsh and the deposit of material brought in through the inlets or by currents from upland waters, and new lands have grown up. In such a manner have the beaches, born of the waters, helped to reshape entirely the coastlands.

Occasionally alarm cries have gone over the land, saying that the coastal plains were still sinking, perhaps at the rate of a foot a century, and millions of people have worried. Scientists, however, are not of uniform opinion regarding such changes, and some say that no adequate proof is forthcoming to demonstrate the truth of what at present is only an unpleasant possibility. Since scientists cannot agree, the layman has little reason for immediate concern. It is rather the horizontal retreat of the beaches under the pounding advance of the sea which justifies his attention.

A generation ago, beaches were valueless—they were desolate, barren wastes of sands, piled in dunes that shifted with the winds or covered with coarse grass and underbrush, and their owners paid the taxes on them chiefly through force of habit. Here and there a lone hunter's or fisherman's shack broke the solitary skyline, or occasionally a more commodious Coast Guard station or lighthouse gave signs of man's presence, but these only accentuated the complete atmosphere of isolation which always encompassed the shifting sands.

Now the isolation is vanishing. Over night the people have discovered that the beaches are a treasure-ground, and the yellow sands golden in the opportunities they give for renewing mental and physical vigor with which to cope with the stress of modern conditions. By the millions they come, these prospectors, from all states and from all walks of life—from the millionaire in his yacht who visits his palatial "cottage", to the happy-go-lucky mill hand, who blows in with flivver and pup-tent and a tonneau-full of mess-kit, blankets and food for

THE DANGER LINE
Once this lighthouse blinked its beacon from a safe distance, but the sea has found its enemy out

a week's light-hearted sojourn at the free auto camp. Twenty millions visit New Jersey; Florida has flowed and ebbed with the multitudes, and the tide of humanity is creeping up there again. In every seacoast state the same evolution has taken place, perhaps on more modest scales. Communities are springing up at vantage points to provide for the wants of the army of recreation seekers bursting from their hinterlands. On the New England coast every picturesque site for a summer home has long been utilized, and yet the great number of shore resorts hardly can serve the density of population which moves seaward with the summer winds.

DESTRUCTION

A gale did this. Mere earth and timbers are no match for angry waters, driven by an onshore wind

To most of the ocean-goers the eternal warfare between land and sea is unknown. The most desirable sites for them are just back of the high-water line, where the spread of ocean is in clear view, and the murmur of waves never dies out. Frequently a beach community in its early state will consist only of a single row of cottages along the sea-front, and the sand dunes, which constitute Nature's principal reserve strength against the advance of the water, will be leveled to suit the demand.

Then suddenly, the peoples of the summer resorts awake to the fact that the sea, which they have considered warm and friendly, can also be harsh and unfeeling,—an enemy. Perhaps they arrive in early summer to find that the winter storms have washed away their beach, and that the waves break at their very doors. In their consternation they seek professional advice, and sadly conclude after consultation that if their homes are to be saved at all, great expenditures must be made. In many cases the only practical remedy is to leave the land to the foe, and move the houses back from the long reach of the sea.

Not always, however, is the demand of the ocean so drastic. More commonly it serves warning of impending encroachments, and advises in its practical way that only through a program of protective work can a community preserve its existing frontage. About the most that can be hoped for is that the attack will be delayed until the community can grow enough to divide the expense without too many heartbreaks. And it is a wise, though almost unique, community which at the very beginning leaves a buffer zone between the ocean and the frontage of its improved section, to be a fort to delay the enemy.

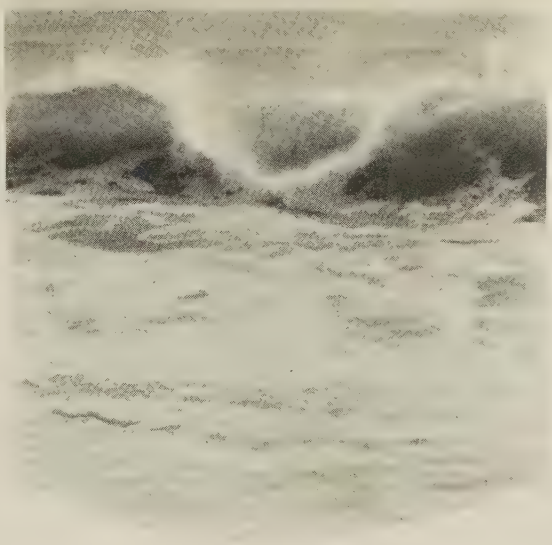
The situation is not hopeless, however, and the welfare which the beaches contribute need not be relinquished. There is urgent need for research by scientists and engineers to devise more effective and cheaper methods of checking the sea. Specialists must be called in on the demand of the public. Demands for them are being made, and so loud has been the call that the governors of the Atlantic and Gulf Coast States and the National Research Council at Washington have united in creating an agency to deal with the problem.

Persons who contemplate a home on the seashore, or who go there annually for their vacations, will enjoy studying the changes in this variable zone where land and water meet. Fascinating is the investigation of the sea. They will learn that on no two consecutive days are the beaches absolutely the same; that the sands are constantly in transit; and that the changes which when viewed through the perspective of years are startling, are but the

A BARRIER DUNE

Cottagers level this protection for home sites, the waters cut it, and the sea creeps up to doorsteps

result of endless toiling of an inquiet sea. The waves can build up as well as carry away, they will discover, and the beach destroyed by today's onshore gale may be brought back by the waves driven by tomorrow's offshore wind. They may hear the natives in the mid-Atlantic section say, "A west wind builds up the beach", and see the truth of the axiom in bits of heavy wreckage or rows of surf-clams cast up along the sands. They will see inlets closed by the alongshore drift, and inlets which have broken through the barrier, and been laid waste by the ocean waters. They will be amazed at the rapidity with which the sea works, at the damage it can do.



THE COMBER

Delicately curling, translucently green, it comes in like a conqueror, fanfares proclaiming its approach

And when you are near the coast land, walk out on some promontory, there to watch the rush of the ocean cutting into the land. Endlessly the waves curl and pile on the rocks and sand; endlessly crumbling fragments whirl back with them as they retreat to form again. If you are imaginative, you can picture the curving beach along the main shore as perhaps once sea bottom half a mile ocean-ward, sand which was stirred and shifted to the border land by the ever-working wind and waves. Perhaps, too, you can mentally trace under the waters the former course of a river emptying nearby,—you can guess where it wound across the shallow continental shelf. Then you can adequately consider, if you will, the permanency and security of your cottage, just back from the water line.

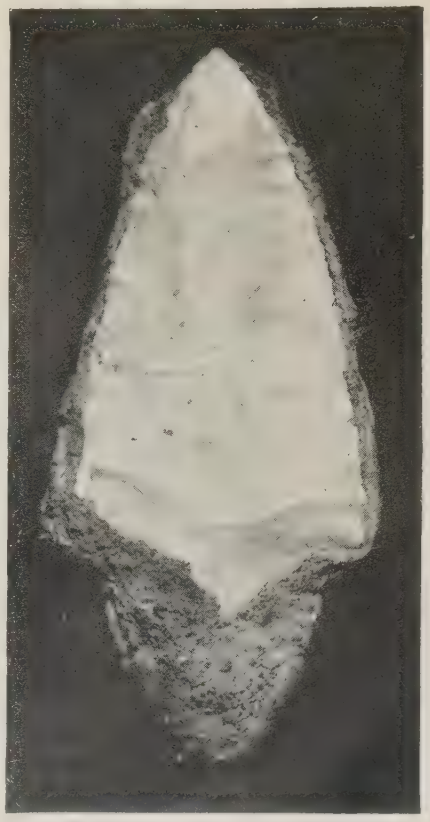
The waters cannot be allowed to conquer without opposition, however. The beaches add too much to the American life,—their treasures are worth more than their possible reclamation and saving will cost. It is the inertia of the sea-goers which will break the slowest, however,—yet it is for them that engineers and scientists must be mobilized, to protect the health and enjoyment of the golden sands.

There is fascination in the pounding of the sea. There is romance and sadness, too. Those who watch will find themselves irresistibly drawn to the places where waters and soil combat; they will come to enlist themselves among the millions to whom the beaches are a great natural asset, whose preservation is a matter of concern to the whole nation. They will grow to be lovers of the border land, of the gleaming barrens of shifting sands.

A Two-Sided Story

by Bruen Holmes

On some by-gone day, perhaps, an Indian shot an arrow into the air at a flock of passing ducks. It missed and fell into the waters of the Missouri River, strongly charged with lime where they ran from the limestone bluffs nearby. Years passed. Little by little the stone blade became incrusted with a limy coat, making a sort of fossil arrow-head. The slough into which the arrow fell was drained, at last, and the arrow of the Indian, long since gone to the Great Father, was found by pale faces, transformed and changed, as the pictures show.



BEAUTY FOR AMERICA TO ENJOY

SAVE *the* YOSEMITE

America's Playground Needs America's Help

ON Decoration Day, 1927, nearly 25,000 people visited Yosemite Valley and every hotel and public camp ground was taxed to the limit of its capacity. How many of those people—how many of the half million men, women and children who visited Yosemite National Park last season realized that part of the beautiful forest extending along the highway between El Capitan and Sentinel Rock is not public property at all, but a private holding which might be exploited for hot dog stands and other undesirable developments? Within the boundaries of Yosemite Park are no less than 11,000 acres of privately owned lands, belonging largely to California lumber companies.

After a careful and exhaustive investigation of the situation threatening timber in Yosemite National Park, Mr. Arthur Newton Pack, President of the American Nature Association, has returned from California with a full report. The accompanying article contains this report and recommendations. It is commended to the consideration of the 120,000 members of the American Nature Association and for their action.

How did this happen? Well, it's a question of history. When the Yosemite Valley was first set aside as a state park no effort was made to acquire the lands which had long before been owned by private individuals; and while 1905 saw exchanges which eliminated some of the private holdings, the plan was not fully worked out and the evil remained.

The National Park Service was created in 1916 and a man who had done more than almost anyone else for the creation and establishment of National Parks was made the first chief of this bureau of the United States Department of the Interior. This man is today poorer in pocket by many thousands of dollars of his own money which he has paid for land given to the various parks.

Everyone knows of the various attacks made upon the boundaries of our parks—attempts to obtain commercial exploitation of valuable water rights, timber, et cetera. For the most part the public has been awakened in time and the parks have been saved. Why was not this situation in regard to the Yosemite made clear before? Why was not Congress urged to buy these private lands years ago before many areas were logged; before the beautiful Tuolumne and Merced groves of big trees were left isolated amid miles of logging slash? A few men who fought to interest the public know, or guess. Those who are now just coming into the fight are inclined to blame the chief of the Park Service and the National Parks Association. They do not know how hard the struggle was to win for the National Parks such help and recognition from the press as has been obtained. They fail to realize that Congress, busy with a thousand ideas, can act only as the result of concerted and united public opinion. This we do know. The National Park Service, a bureau of

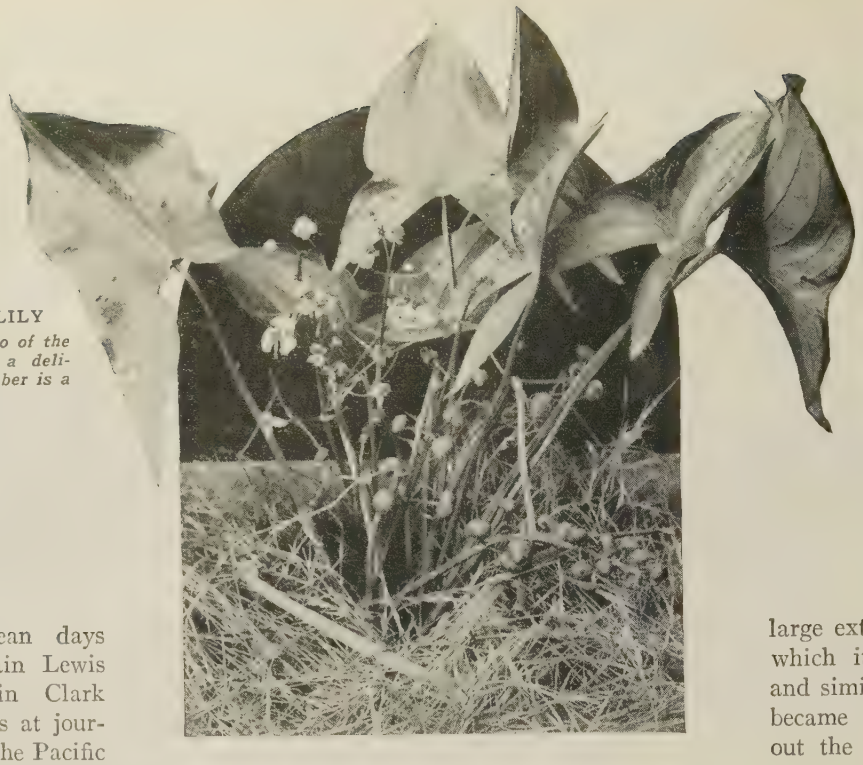
SHALL IT LOOK LIKE THIS?
Trees once shaded this highway, and here wild life called. Then came axe, and fire

the Department of the Interior, tried to get support for purchasing those private lands in the Yosemite. It tried, failed, and decided that the only hope lay in compromise. Such a compromise was arranged—a moving of the park boundary line on the west side, thus throwing out of the park some thirteen thousand acres of public land and much private land. This public land removed from the park would be given to the private owners,—the lumbermen,—in exchange for a valuable parcel of timber, seven thousand acres, known as the Cottonwood Grove and desirable for public land. Both the Merced and Tuolumne groves of big trees would thus be excluded from the park, but would be separately protected as National Monuments, and the public land given to the lumbermen would be logged only according to the restrictive regulations of the Forest Service. Nevertheless, as accessibility to logging railways and cost of lumbering and so forth entered into the figuring, it appeared that the Park would lose 13,000 acres for 7,000 gained. The deal was judged fair from the lumbering viewpoint, but it certainly appeared to be unfair from the public view.

Fortunately something happened. The Yosemite Lumber Company announced in February that for financial reasons its operations within the Park would be suspended. Immediately Director Mather, Chief of the Park Service, seized the opportunity to call off the impending compromise trade and make another try for public support to buy out the private lands instead of exchanging them. A representative of the New York *Times,* Nicholas Roosevelt—cousin of the great champion of conservation—chanced to be in California, met Director Mather, and went to the Yosemite. This great and powerful newspaper took up the cudgels at once, to wake a dormant public.

The march of events has been rapid in the last few weeks, however, and even as we go to press, we cannot tell just what the situation will be a month hence. The Yosemite Lumber Company and the White and Friant Lumber Company have given options on their holdings in the Park to the Sugar Pine Lumber Company of Fresno, who, it is reported, plans to begin operations at once should it take up the options and secure the land. America must act rapidly if they are to safeguard this piece of scenic splendor. It was hoped at one time that should a crisis arise the Forest Service could exchange timber rights in the Stanislaus or Sierra National Forests for Yosemite land, but this method seems to be impossible without additional legislation. The Forest Service finds that it has no real authority to make such a great exchange, which involves nearly $2,000,000 and some 600,000,000 board feet of lumber. It cannot take away from the counties in which the national forests exist the 25% portion of the revenue gained from the sale of Forest Service stumpage, as this is guaranteed them under existing law. Secretary Jardine of the Department of Agriculture has suggested that a bill be proposed in Congress which would authorize the exchange to be made from National Forest lands in any part of California, and which would order the Treasury Department to reimburse the counties for the losses they should not, and cannot afford to bear. Secretary of Interior Work has concurred in this proposal. It seems to offer the best solution. The only alternative looming on the present horizon is to go back to the suggested boundary change, which will throw eleven thousand acres of Yosemite timber out of the Park, to be made into boxes and fence-posts and doors. This is unthinkable; the approach to Yosemite must be saved.

Let every lover of the Out-of-Doors join in the battle. Write to every Senator and Congressman of your state, asking them to support a Yosemite exchange bill in the next session of Congress, or introduce one. California is hard pressed at present with its state park bond issue. The lumber industry is suffering from over-production resulting from too enthusiastic promotion and over-capitalization, and the new move of the Fresno organization seems strange, in the light of conditions. Their officials, however, are men of public spirit,—perhaps they will listen to the demand of the citizens, that Yosemite shall not further be marred with the axe. Every outdoor-lover must cry aloud with pen and voice, "Save the Yosemite".



ARROWHEAD LILY
The famous Wapatoo of the Multnomah nation, a delicate flower whose tuber is a food

SAVAGE GARDENS

Nature's Crop for Her Nut-Brown Children

by Ben Hur Lampman

IN THOSE lean days when Captain Lewis and Captain Clark found themselves at journey's end, with the Pacific before them and a continent behind, they were hungered—as they had often been on the overland journey—for the simplest of vegetables, for any green and growing food that might vary the monotonous fare of game and salmon. And the strange but welcome foods that the Indians offered them, out of the bounty of the wilderness, were very pleasant to their palates—as boiled young nettles were to the brave men and women who made conquest of Kentucky.

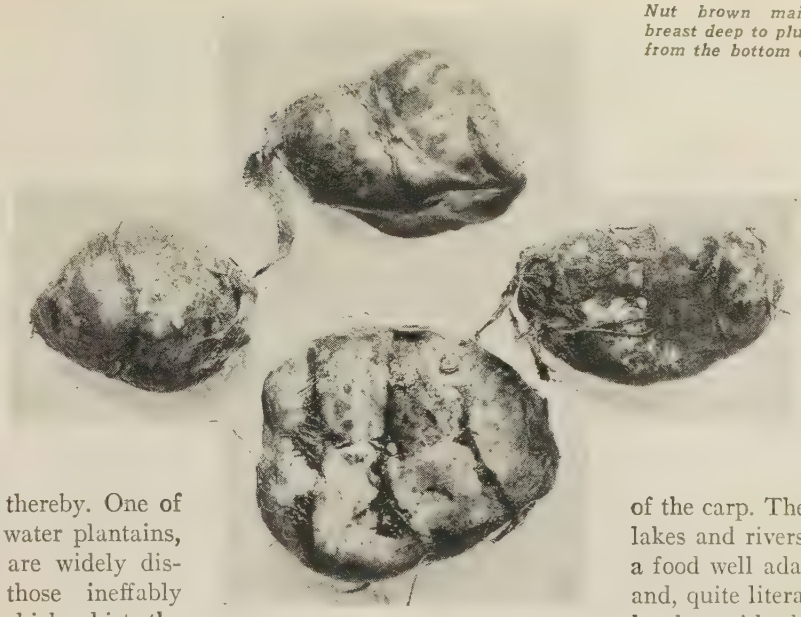
If you seek these foods in the Oregon country today, and ask where they are to be found, few are left who may aid you—if we except the botanist—and these are men and women who stand in the sunset very near the last divide. And this is strange enough, since two of the plants that gave the Indian food, and that balanced his rough diet, have bestowed their names on many localities. The "Camas Prairies" of Oregon and Washington are many, and here and there are found vicinages bearing the prefix of "Wapatoo". The camas, of the genus *Quamasia,* is that widely petaled flower of delft blue which sprinkles the western sod in June, and which, oddly enough, lacks yet a common christening from its white inheritors. Its bulb was an Indian staple. The wapatoo is the arrowhead lily, common to every pond or lakeside in the old days, and its tubers were the potatoes of the tribe.

In that olden time, when the Indian nation of Multnomah dwelt on Wapatoo Island, where the Willamette River flows sweetly into the great Columbia, there grew for the nation, without effort or cultivation, an unfailing crop of the edible tuber which gave to the island its name. Later the island lost both its original name and, to large extent, the tuber for which it was christened, and similarly the wapatoo became depleted throughout the region. And this last because an alien fish found the sweet tubers quite as much to its liking as did the tawny overlords of the land.

The Multnomahs are gone, all but obliterated by disease, their remnant scattered by civilization. Cattle graze in those swampy meadows where squaws and brown children gathered the prized and principal food of the tribe. And the cranes are gone, and the huge white swans that trumpeted above the cottonwoods, and deer swim less often from the mainland, and old men, sons of pioneers, men who were born on the island, say that a half day's search may find you only so much as a single plant.

Yet the wapatoo is coming back, out of the past. In hidden places, in quagmires where cattle do not graze and where the carp do not penetrate, some few of its tubers have persisted, and gradually, very gradually, the island of the Multnomahs is regaining its own. Occasionally, in low spots along the river dikes, the white flowers of *Sagittaria latifolia,* or arrowhead, lift against some background of green rushes. For within the dikes, safe from the marauding carp, the wapatoo is enabled to flourish again. And, in a simple way, it is a lovely flower.

The white of the three-petaled wapatoo blossom, borne on long stems rising stiffly from the ooze, challenges the eye. It is like to new ivory, this flower no larger than a strawberry blossom, and it is bowered amid the deeply notched, characteristic leaves which, separate from the flower stem, bestow upon the plant both its scientific and common names. For the Latin word *sagitta* signifies an arrow, and the leaves of the wapatoo or arrowhead



ROAST OR BOIL
Nut brown maidens waded out breast deep to pluck up these tubers from the bottom of the bright lakes

are aptly described thereby. One of the great family of water plantains, its kindred species are widely distributed—and in those ineffably green marshlands which skirt the lower valley of the Yang-tse Kiang, in that elder country of the Orient, Chinese farmers cultivate an arrowhead quite similar to our own.

The food yield of the wapatoo is a true tuber, ranging in size from the bulk of a hazelnut to that of a hen's egg, or even larger; and the tuber is hidden in the thick, fibrous mass of the roots. At the season of its maturity, in late autumn, the wapatoo tuber is a light, polished brown, smooth of surface save where it is girdled by leaf scales. The interior is a starchy whiteness, of the consistency of the potato, and possessed of a rich, nut-like flavor, marred only by a slight after-taste of bitterness. Men and women who have lived long in the Oregon country well remember the flavor of the wapatoo, and maintain that its food value is fully equal to that of the potato, and that it is one of the finest of vegetables, either boiled or roasted. Indeed, there was a time when the white stranger in Oregon was heartily glad to dicker with the Indians for a few dozen wapatoo tubers. The journals of Lewis and Clark reveal that these explorers secured the prized food in trade. The wapatoo held a recognized place in savage commerce, for the Multnomahs used it largely in barter with more distant tribes.

Until the carp were released in western waters, half a lifetime ago, the wapatoo held its own—although grazing cattle waded flank-deep to tear it from the lake beds. But the coming of the white man with his herds was as nothing to the coming of the carp. These vegetarians of the lakes and rivers found in the tubers a food well adapted to their dietary, and, quite literally standing on their heads, with broad, reddish tails waving happily above the surface, they uprooted the wapatoo and harried it to the point of disappearance. Those ponds which yet retain it, and in which it is recovering its courage, are such as are protected by geographical circumstance from the incursions of the carp.

Had you been on Wapatoo Island sixty years or more ago, in the fall of the year, you would have seen the last of the Multnomahs harvesting their strange crop. To reach the finest plants, productive of the largest tubers, the laughing, gossiping squaws waded breast-deep in the bright water—for it was bright water, before the carp came. They drew behind them, each squaw, a small canoe, and with their bare, brown feet they freed the roots of the wapatoo. Up from the ooze they plucked it, with its leaves so like a broad arrowhead, and as they stripped it of its tubers they cast these into the canoe until the craft was heavy laden, while mongrel dogs yelped along the clovered shores, and children shouted at their play, and the first of the northern flight passed high above them and dark against soft clouds. Of the tubers they made a kind of flour that was stored for winter, and, too, they feasted on the fresh wapatoo, boiled or roasted.

There is a deal of history in the ivory flower that lifts against the dark green of the rushes. Why, Lewis and Clark borrowed its Indian name to designate all the great area of the lower Columbia district, calling it "Wapatoo Valley", as well as Columbia Valley, and observing that the former name was the more fittingly chosen, since it

COMING BACK
The carp nearly destroyed this Indian staple, but the water plantain is slowly regaining its lost acres

paid tribute to "that root or plant growing in this valley only". The ancient island was later rechristened Sauvie's Island, after a Hudson's Bay employee. One could wish that it might have kept its older and more significant name.

The bulbs of the camas, that second food staple of the Columbia river tribes, were scarcely less prized, although the camas was everywhere to be found in season. Indeed, it must be of delectable savor, this viand of the savage, since one reads that it enticed him to gluttony, and that his great feasts of camas were followed by periods of physical penance no less pronounced. Of the camas, Captain Clark, in that quaint border style which marked his journal, says that bread made from it was called pas-she-co, and describes one method of cooking the bulbs in these words:

"Emmence quantity of the quawmash or pas-she-co root gathered and in piles about the plain; these roots grow much like an onion in marshey places. The seeds are in triangular shells on the stalk. They sweat them in the following manner, i. e., dig a large hole three feet deep, cover the bottom with split wood, on the top of which they lay small stones of about three or four inches thick, a second layer of splitted wood and set the whole on fire, which heats the stones. After the fire is extinguished they lay grass and mud mixed on the stones. On that dry grass, which supports the pas-she-co root, a thin coat of the same grass is laid on the top. A small fire is kept, when necessary, in the center of the kiln".

The roots of two other common plants were also valued foods of the northwestern Indians. One root, described by an early explorer as having the flavor of the sweet potato, was that of the wild blue lupine which yet quite literally marches in unbroken miles of bravely tossing blue through various uncultivated districts. The lupine roots were roasted. It is not reported that the Indians ate the seeds of the lupine, which are typically leguminous, although the seeds of certain varieties are edible and in various parts of the Old World are an important item in the fare of the poor. The second root gathered by the Indians was called "black root", but was no more than the long, parsnip-like root of a common thistle. This root had its uninviting name from the fact that, in cooking, it turned quite black of hue, but those who have eaten it, to determine how the Indians fared, will testify that it is a toothsome vegetable. And a third, but lesser viand, was the bulb of the horsetail rush, that singular plant which seems too strange and gnomish for earthly meadows.

It is characteristic of all savage peoples who live chiefly by the chase or by fishing that they learned long ago,—so long that no tradition keeps the vestige of record,—the wild vegetation suited to their dietary needs. It was so, of course, that every plant in our kitchen gardens, each vegetable in the market stalls, was first discovered and induced to tameness and to greater and superior yield. And, as an aside, it was the bronze spears of Darius the Persian that cleared a way for alfalfa, the purple flower of the Medes, but the story of its first cultivation is utterly lost in antiquity. Our civilization, however, does not always, nor often, avail itself of the more immediate lessons in savage, immemorial gardens. Who knows but that some Burbank might urge the wapatoo to high importance, cause the thistle to become an ally and friend, and flood some fruitful field with close-packed, wind-blown blue blossoms of the camas?

A Nature Episode

By Marie I. Wixon

She started for the park one day,
A happy, smiling little miss,

A big white goose just looked at her,

And after that, she looked like this.

BROODING TIME
Back to the nest, to three white eggs, comes the mate of Sky-King, hissing and screaming to drive off a foe

SONS OF SKY-KING

A New Brood to Circle in the Skies

by Ben East

Photographs by Walter Hastings and the Author

Readers of Nature Magazine will remember "The Home of Sky-King", written by Mr. East, which appeared in March, 1927, and which told of the first three sons of the great proud eagle. Another year has passed, and Sky-King and his mate have brought forth two new sons, who first peeped out from their shells in the same nest in the same mighty oak. It is of them and the banding of their legs that Mr. East writes this time, and we believe that the Nature editor of the Grand Rapids Press and wild life lover has surpassed his previous efforts in colorfully and sympathetically picturing these regal characters of the air

MIDSUMMER has come to the forest, and along the wood margins the black-eyed susans are blazing like golden stars. Somewhere above the northern wilderness three young bald eagles are winging, uttering their loud hisses and their queer guttural cries. Different from their fellows are they,—for on their yellow legs are the aluminum bands of the United States Biological Survey. They are the sixth, seventh, and eighth of the eagles to be handled by man, to have submitted their ankles to the demands of science in the United States.

Two of them are the sons of Sky-King, the great eagle whose acquaintance I made one sunny day more than a year ago. They were reared in the same bulky nest, perched in a high crotch of an ancient oak, where last summer Sky-King and his mate raised three fledglings safely to eaglehood. The third is the son of another pair of royal, white-headed birds, whose aerie is in a monarch pine, halfway down the side of a steep basin that overlooks a wild stretch of a forest-flanked northern stream.

It was mid-April when I first saw these children of Sky-King. I found him as before, perched on his lookout tree, a dead spruce spar looming above the forest tops. Alert he was in guard over his mate, who brooded patiently among the leafless branches of the great oak, and, as on other visits, I was warned by his wild, fierce screams that I was near his nest.

Whether Sky-King remembered me from my visits of last summer, I do not know. At any rate, when I had buckled fast my steel climbers and adjusted my ropes, he mounted high above me with the mother at his side, and from the vantage point of a thousand feet the two watched while I ascended the rough bole of the oak to their home. Never once did they descend close to threaten me, and only occasionally did they scream.

As I reached the nest, puffing hard, I could see that it was as big as ever, and in good condition. Weeks before, the rubble of last year's nesting had been cleared away, and dead branches added to the bulky platform and dry grass gathered for soft lining. And on the smooth floor were three white eggs, just as there were last year.

THE FIRST OUT

One son of Sky-King is born, while his brother peeps loudly through a cracking shell. Insert shows the lofty home

How prolific this mate of Sky-King! Rarely indeed does the bald eagle boast of a clutch of more than two eggs, yet for at least two seasons this ambitious old mother has reared triplets instead of twins.

My visit to the nest was a brief one that day. The spring wind was still sharp, with a trace of snowdrifts yet unmelted in the deep swamps in its sweep, and Sky-King himself would have risked chilling those three eggs as soon as I. Thus I could only hazard a guess as to when the eggs would hatch. Two weeks later, however, I was back, and fate was kind to me. Before my head came above the rim of the nest I heard an insistent peeping that told me my visit was to be a fruitful one.

One of Sky-King's sons had hatched that morning. True to her habits, the mother eagle had begun to brood when her first egg was laid, so her eaglets came one by one. The young eagle lay on the grass lining of the nest beside the two eggs, a soft gray chick that looked more like a descendant of a pair of barnyard fowls than a son of royal lineage. Close beside him lay a big, freshly-caught sucker, the first of the season's supplies, carried to the nest in all probability by Sky-King himself while his mate brooded closely on the hatching eggs. From this the fledgling had already enjoyed a fish dinner or two, torn free and fed to him by the scimitar beak of his mother.

As I viewed the scene I thought what an occasion the catching of that first fish for the nestlings must be! It is an achievement, a symbol of the fulfillment of weeks of nest building and brooding and guarding, and it ushers in the happy era when the vigilant hunting over river and forest-rimmed lake may never slacken, if there is to be sufficent food in the nest to still the clamorous demands of the eaglets.

But not long will the sucker serve only one, I saw. A second egg was pipped, and from a tiny aperture in its side a small black beak protruded. It was from this unwilling prisoner that the peeping which had escorted me up the tree arose. With all the imperious insistence of any royal scion he was demanding the warm, feather-cloaked breast of his mother over him, to aid him in bursting out of his hard white case.

And it was on this day that Sky-King's mate showed the greatest resentment at my presence. She knew how urgent was the need that she brood constantly, now that the promise of life was so imminent in the two remaining eggs, and she wheeled close above the tree-top, watching me with her fierce yellow eyes, screaming time after time to drive me down from her nest. I wonder yet what would have happened had she found the courage to come down and defend her home with beak and talons. A perch in the lofty branches of that old oak would be a sorry one from which to meet the onslaught of an infuriated mother bird, upon whose spread wings I could lie and not nearly reach from tip to tip. Again I hurried with my work and left, and almost as soon as I was out of the tree she came soaring through the branches and settled upon the nest.

THE AUTHOR WINS

While the indignant bird sat on his captor's knee and registered profane protests about it all

Late in May I went back to do the real work of the season with the sons of Sky-King. I was ready now to band them. With me on this visit went Walter Hastings, one of Michigan's well-known

THE OPERATION
High in the old oak the author swayed with the wind, while a downy mass struggled feebly as the band slipped on

bird men, and staff photographer for the state conservation department.

Something had gone amiss in the nest of Sky-King, and his mate had lost for this season her record for large families. Two young eagles were sprawled lazily on the grass lining of the nest, and beside them lay an unhatched egg. Inspection revealed the egg to be infertile. It reposes now in the museum at the University of Michigan, the only one of its kind in the collection to have been taken from the University's own state. So at least Sky-King and his mate have been of some service to science, however disappointed they may have been over the egg that failed to hatch.

The nest completely fills the crotch in which it is perched. The nearest foothold was in a neighboring fork of the tree, nearly the length of a man's body away. We tied our ropes about our bodies, beneath the arms, and made them fast to a branch overhead. Leaning all our weight upon them, and with steel climbers braced firmly in that distant fork, we swung out and down until our shoulders rested against the rim of the huge nest.

It was a precarious perch, swinging there with both hands free, while we adjusted and secured the bands with pliers, but we took turns at it, each banding an eaglet while the other clung to a dizzy seat high overhead and recorded the work with his camera.

How soft and warm and downy to the hand were those helpless sons of Sky-King, and what a thrill ran through me as I thought how those little gray eaglets, that now lay there so resistless under our fingers, would spread their broad wings a few weeks later and soar out over the forest, to mount higher than the clouds, to plunge into wilderness lakes, rising like shadows out of the curtain of morning mists, and awaking echoes across rock-girt valleys with wild free screams. The bands are flat strips of aluminum about a quarter of an inch wide, attached to the bird in the form of a smooth ring, which must be large enough to allow for ample growth, yet small enough not to slip off over the foot. Each band carries a serial number and the legend, "Notify Biological Survey", on the outside surface, while the address of the bureau,—"Washington, D. C.", —is engraved within. The bureau card indexes the details: placing of the anklets on these birds, recording the species, date and location of banding and name of bander. Subsequent data is also added as reported.

JUST HANGING ON
Hardly a handhold for the author as he tried to grasp the eaglet in its pine-tree aerie

We placed the numbers 312905 and 312906 on the legs of Sky-King's sons. Remember them. You may find them sometime.

Late that same day I came upon the aerie of the second pair of eagles. It was nearly dusk and a fine cold rain was falling. The nest was perched on the first branch of the ancient pine, at dizzy height, at least sixty feet from the ground.

It was a nerve-wrenching climb up the smooth trunk of the old pine, made slippery with the chill rain. My fingers were numb with cold when I adjusted my ropes at the foot of the tree, but before I reached the nest they tingled from clasping frantically at the rough bark. The motion of that old, storm-scarred pine, fire charred at the roots, as it swayed and twisted in the wind that swept up the

basin, was a sickening thing to a puny human clinging like a fly against the bare trunk. Finally, however, the nest was reached without accident.

Only one eaglet awaited me here, and there were no signs to tell whether there had been other eggs in the nest or not. This single bird was a big lusty chap, and he met me with shrill hissing and guttural croaks. Beside him on the nest, which was strangely lined with dead grass and a quantity of cornstalks, gathered by the eagles from the clearings farther down the river, lay a medium-sized bullhead, freshly caught. It was the first of its kind I had ever seen in such a predicament, and recalling the punishment his stolid, wide-mouthed kinsmen had inflicted on me with their horns in boyhood angling days, I had to grin at him in his sorrow.

WHAT NOW?

He hardly knows whether to be fierce or afraid, this chick, who came down from his nest for the anklet

There was no handhold on the wet trunk of the old pine to which to cling, and I dared not trust adding my weight to that of the big nest on the few branches which supported it. So for that night I gave up banding the young eagle, and climbed slowly down again. Three days later I returned, went aloft to the nest, tucked the eaglet snugly into my biggest camera case, despite his loud, and I suspect profane, protests, and lowered him to the ground on the end of a strong light rope. Then I climbed down, removed him from the improvised elevator and made fast his metal anklet. After which I went aloft once more, hauled him up after me and set him back in the nest again, where he sat and regarded me with a half resigned, half baleful look. His band is number 312907.

In June I paid a final visit to my three young wilderness friends, to see how they had fared with their strange adornments. I found them big, lusty birds, with well developed plumage. The youngster in the pine tree was fast approaching his first flying days. He seemed to have grown a bit more rapidly than Sky-King's sons, perhaps because he had not needed to share his abundant fish diet with a nest mate. I was greeted that day with loud hisses and the cries of adult eagles, given in the falsetto voice of youth. All three of the young eagles stood erect on the flat platforms of their nests, their metal anklets gleaming conspicuously on their yellow legs. Apparently they had not resented the bands, indeed they did not even seem aware of them.

It was with a feeling of regret that I climbed down past the rims of the two nests that June afternoon, out of sight of the three eaglets. Doubtless I shall never see them again, and when next I hear from one of the numbered bands the word will be that Sky-King's sons are one less, or that the fledgling from the ancient pine no longer soars above the forest. Thus will they pass, these royal youths, whose screams now awaken echoes in the hills.

SONS OF SKY-KING

Soon they will go winging over crags and valleys, free as the wind, to meet their end,—how?

THE OCTOBER ISSUE

WE ARE *glad at this time to tell you something about the October California issue, which will be the first of the series of sectional numbers we are to run two or three times a year. Under the unusual and attractive cover drawn by Mr. Jex and in back of the scenic frontispiece painted by Mr. Horsfall you will find "The Land of Many Climes", written by C. F. Talman; "On Location", a "movie story with a difference", contributed by Mel Wharton, and Elizabeth Kellam de Forest's article on the whys and wherefores of gardening in California. Mr. Arthur Newton Pack will take you through Death Valley, and H. C. Bryant leads the way through the National Parks. Charles Francis Saunders has written fully and well concerning the wild flowers, the trees and the shrubs of the sunshine state. Wallace Hutchinson knows the forests, and advises of them. We just mention these articles among others, and we say nothing about the pictorial displays, preferring that you come upon them as a surprise.*

We repeat our offer of sending four copies of this issue to any four addresses for one dollar. Orders will be received up to August fifteenth, and in order to estimate our demand, we hope that you will place yours early.

Without attempting unduly to excite, we must observe that editorial opinion seems to indicate that this number will surpass previous efforts, both textually and physically, and will keep our staff very, very busy trying to maintain the standard it will set for the future.

SOMEONE IS MAKING FACES AT ME
But I cannot catch him at it because all I see is an inscrutable velvety mask

Little Sir Sauciness

Pansies, Members of the Garden Intelligentsia

by Otto Wilson

Photographs from J. Horace McFarland

YES, THERE'S no mistake about it. Sauntering through the park I am suddenly aware that someone is making faces at me.

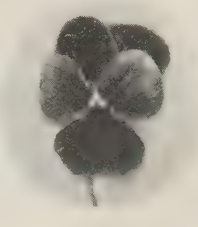
Quickly I turn and gaze squarely into the face of that floral imp by the sidewalk. But does he seem sheepish, or look guilty or confused? Never in the world! On the contrary he is all innocence. With head nodding forward on short stem he owlishly contemplates the grass twenty feet beyond my shoe soles. He doesn't even know I exist. More than that—as I study him I am not even sure he has a face at all. There *was* one there a moment ago. But now it has slipped behind a parti-colored, velvety mask, and I see nothing but golden-hearted bloom.

But wait! No sooner do I stride on along the flower-bordered pavement than there he is again, seen out of the corner of my eye, pug-nosed, impudent, saucy, infinitely independent. What to him is my natural dignity as a high-and-mighty human being? If my dignity wants to get ruffled it can. Precious little would he care for such pomposity if I were the king himself, swinging a scepter and wearing a flashing crown.

What a flower is the pansy! How it works its way into your affections and takes its place there as by right, before you know anything of it at all! Other flowers have a far more valid claim to your admiration. A rose, no doubt, comes very near being Nature's highest achievement in beauty among blooming plants. Gaze into the glowing heart of a white peony bearing its great globules of shining dew and you will see the very freshness of morning itself. Primrose and daffodil, bluebell, buttercup—each after its fashion spells ecstasy for your eye. But only the pansy has personality. That little blotched face, wrinkled, ancient, gnome-like—surely it is some wise, wise old man whom the high gods, in one of their very human whimsies, have changed into a wayside flower as once they changed the self-infatuated Narcissus.

When, finally, I have that cherished garden of the future,—that same pleasant garden so many of us are going to have,—pansies, to be sure, will be there in riotous profusion. Meanwhile I may indulge my affection for His Sauciness by finding out something more about him. First to the records to see what a trail he has left in the history of vanished generations.

Indeed, he has kept good company, I find. Poets particularly have taken him to their hearts. Quick to read a moving consciousness into all the world around them they have not failed, with their sensitized imagination, to catch the signals of impudent challenge flashed upward to them from the grass. In volumes of poems by the lesser versifiers "pansies" is an ever-recurring title-word. But the trail leads also directly up to the Olympus of the greatest figures of all. Milton, in "Lycidas", takes note of "pansies streaked with jet", and Shakespeare has the mad Ophelia give



PANSIES HOLD A PROMINENT PLACE IN POETRY

Shakespeare also gave this interesting fellow immortality in Midsummer Night's Dream

voice to what, no doubt, was a well-known characterization of his time:

"There's rosemary, that's for remembrance; . . . and there is pansies, that's for thoughts".

It was the great Elizabethan, too, who set the pansy once for all at the very pinnacle of literary prominence. Surely if printed pages ever carried a distillation of pure poetical fancy they are those on which the lines of "A Midsummer Night's Dream" are inscribed. And the pansy's rôle was that on which the whole light plot of the fairy fantasy turned.

You will remember the machinery of the play. Oberon, king of the fairies, has quarreled with his queen and wants a potion to drop on her eyelids while she sleeps, so that she will love the first living thing she sees when she wakes. He tells Puck how once he saw Cupid, all armed, "flying between the cold moon and the earth". The little Love-god aimed his shaft at a fair vestal queen reigning over a western realm. But all in vain. The queen passed on, untouched, and the arrow dropped to earth.

"Yet marked I where the bolt of Cupid fell:
It fell upon a little western flower,
Before milk-white, now purple with love's wound,
And maidens call it love-in-idleness".

Others called it "Heart's ease". But it was simply our pansy, or an ancestor of our pansy resembling it. When the fast-flying Puck had brought it it did indeed demonstrate its magic love-awakening powers most efficaciously. Its potent juice, squeezed upon one sleeping eyelid after another, caused all the mix-ups among fairies and humans which make up the plot of the play. Could ever a flower ask for a more prominent place in the world's literature? Even the rose could be jealous.

Coming to more matter-of-fact details, I find that the origin of the pansy is wrapped in mystery. It is recognized as a member of the violet family, and is usually taken to be a descendant of *Viola tricolor,* a vagabond inhabitant of European fields and hedgerows. But no one can say whether it arrived through natural selection or is the offspring of many different species of violets. On one point, though, the authorities are agreed. For centuries it has known the care of human hands, and it is today essentially a product of garden cultivation. So if it has personality it has come by the quality honestly.

But the more recent history of the flower is well known. By common consent it dates back to 1813, when Lord Gambier, an English nobleman with an estate in Buckinghamshire, had his gardener Thompson experiment with some roots of the common yellow and white Heart's-ease. The results from a few years' handling were most gratifying. The flower improved in shape, color, and size, and when presently the growers, now including many others besides the pioneers, began crossing them with other species and bringing out different color grounds and edgings the present wide range of strains began to appear. The process has continued for a century and has brought about the bewildering and eye-catching variety that greets us in nearly every large bed of the flowers.

PANSIES FIT IN MANY NOOKS OF THE GARDEN, ADDING CHARM

Even the rawest amateur gardener should have no difficulty in growing the pansy and in getting fine effects

It is the riotous profusion of colors and other characteristics that makes the pansy such a favorite with the garden grower. Solid hues of yellow, blue, white, wine, orange, and more, mingle with a grand medley of mixed shades and tints. Some flowers have bright golden eyes, some dark. Some are "rayed", with short lines running

out from the eye, some "rayless". Strains have been developed with crimped wavy edges which are widely popular. Spurred on by the desire to produce striking plants for exhibitions, growers have built up the sizes until their blooms have measured three inches and more across the face—although in doing so they have had to leave much in the way of charm behind. One pansy-lover records a stem-growth of more than two feet. Forestalling the comments of the skeptic, he hastens to add that he can bring witnesses to testify to the measurements.

Perhaps the most distinctive achievement of a century of cultivation has been the production of the "viola", so-called, or "tufted pansy". This is a bedding variety with spreading root system obtained by crossing an ordinary pansy with the European horned violet, *Viola cornuta*. It bears a multitude of flowers, blooms over a long period, and is more hardy than the single-stemmed pansy, being a perennial like its horned violet parent. English growers are particularly fond of violas and have developed more than fifty named strains. But they are not so well known in America.

I shall, indeed, have a variegated pansy army in my garden-to-be. But this is not to be an armchair garden

MANY VARIETIES OF PANSIES HAVE BEEN DEVELOPED

A century has wrought many changes in this flower in the way of pattern and color

THE EVER-VARYING FACES OF THE PANSY ARE ALWAYS FASCINATING

They have been developed to have long stems, large blooms and an endless variety of color and markings on them

but a very real one, associated with such realistic matters as good rich soil, sunburned necks, and perhaps at times slightly aching backs. So I want to include in my collection of "pansyisms" some down-to-the-ground facts about pansy growing. My gardener friends answer my queries readily.

"Yes", they tell me, "if you plan beds with formal designs you can get solid-color flowers ('selfs' we call them) about as you want them. Pansy-seed growers, of whom there are many, can be depended upon to supply seeds which will reproduce the exact colors they promise.

"Yes, pansies will bloom profusely from early spring to late fall, if rightly handled, except that they do not like the hot summer months. If your climate is such that summer heat is moderate you can have pansies fairly continuously.

"Will the plants live through the winter, you ask? Often they will. But growers nearly always sow new seed every year, and set out new beds, and if you want to be sure of good results you would do well to follow that practice.

"When to sow? Well, if you want early spring flowers sow the seed in the preceding fall, say in September. Sometimes the gardener will get the seed into the soil as early as July. The advantage of summer or fall sowing is that the plants will then have time to develop a good root-growth and be ready to expand their energies in producing blossoms in the spring. But early spring sowing will bring summer flowers, and for fall blooming the seed may be sown in June or July.

"Yes, pansies require rather more attention than many other flowers, but they are not hard to grow. The seed sown in a cold frame or in good rich garden soil brings plants which must be transplanted at least once. They must be guarded against very hot and dry weather, birds, and certain insect foes. Fading flowers must be picked off from day to day if you want others to come in goodly numbers. Some shade helps out in mid-summer heat, and moisture is always a requirement. But the return for this attention is a prodigality of blooming such that an ordinary bed will keep your vases overflowing and your yard or garden glowing with color".

And so on. Clearly a fine pansy bed is easily within the reach of even a raw amateur at flower-growing. That is encouraging. It brings the garden of the future a little nearer. Perhaps it will not be so long waiting after all.

FIRST PRIZE

"Young Antelope"

E. T. Scoyen
Zion National
Park, Utah

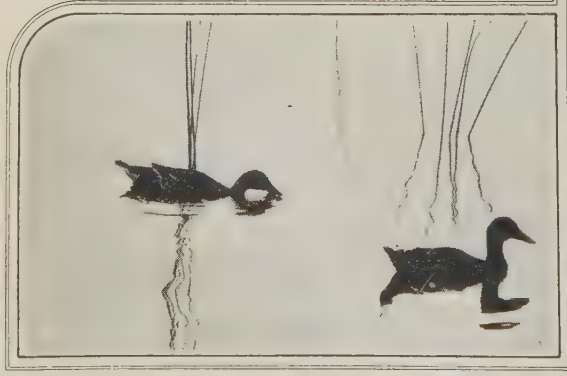
GARDEN CONTEST DELAYED

Owing to the decision to devote the October issue to California, the Garden Photographic Contest will not close on August 31, but will remain open another month, thus enabling photographer-gardeners to enter last-minute pictures of their handiwork. The September contest will be devoted to Outdoor Good Manners, and closes July 15. We urge photographers to camera as they ride during these summer days and note man-made ugliness.

SECOND PRIZE

"At the Smiling Pool"

H. T. Middleton
Hainesport, N. J.



HONORABLE MENTION

"Mallards"

Lewis J. Merwin, Negaunee, Mich.

HONORABLE MENTION

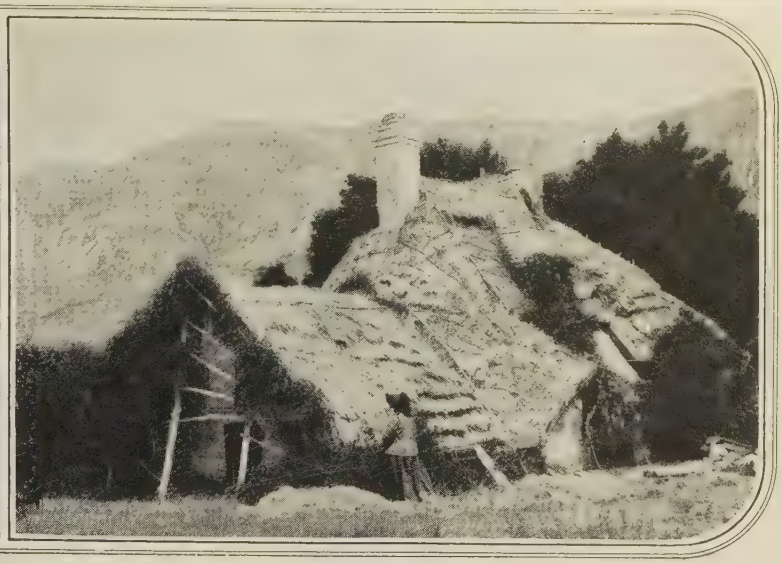
"Tumbling Waters"

Gordon Whittle, South Orange, N. J.

THIRD PRIZE

"Buck and Friends"

Mrs. Joseph Watson
Yalesville, Conn.



HONORABLE MENTION

"A Mountain Home"

Mrs. Frank Aspinwall
Long Beach, Calif.

HONORABLE MENTION

"Garter Snake Digesting a Meal"

Carl Krebs
Lakewood, Ohio

THIRD PRIZE

"Snow and Shadows"

Fred E. Brooks
French Creek, West Va.

HONORABLE MENTION

"Reflections"

Ada L. Armstrong
Santa Barbara, Calif.

THIRD PRIZE

"American Woodcock"

E. R. Osterndorff
New York City

"A Moonlight Chorus"

by Will Simmons

Will Simmons, son of the American artist Edward Simmons, is one of our most celebrated etchers of wild life. At an early age natural history museums so interested him that the study of wild creatures has always dominated his artistic life. Whimsical humor pervades his well-known etchings of monkeys. He is now living on a farm in the Berkshires, where he raises his wild life models and lives close to Nature

WILD LIFE in ETCHINGS

Artists Who Etch Wild Life Evoke Interest in Conservation

By Dorothy E. Pletcher

With the passing of the frontier and the subsequent commercialization of America, we seem to be moving in a realm of sophistication devoid of the romance of the out-of-doors. Apparently as an answer to the insistent appeal of scientists for the conservation of our wild life, there has appeared a group of artists who are devoting the major part of their artistic project to etching our wild creatures.

Although these etchers are few, their influence is far-reaching. Happily, in depicting wild life, they have chosen etching as their medium—the picture in duplicate that reaches a larger public than is possible for any other form of Art. Not only are they enlisting national interest in our rapidly vanishing creatures, but they are making æsthetic documents of a scientific nature, to be used, perchance, several hundred years hence in the research of ornithologists and mammalogists. In short, they are contributors to another Renaissance—a sweeping reform of the American mind on the subject of the conservation of our wild life.

And let no one think that this field of etching is unattended with difficulties. One has only to approach

"Chums among Geese"

by Fugi Nakamizo

The pictorial appeal of Nature manifested itself to Fugi Nakamizo in his early youth. Living in a little town near Tokio, he roamed the countryside studying wild life and landscape, imbued with a love for them and the desire of becoming an artist. He came to this country in 1910. The late Joseph Pennell, a master etcher, was his teacher. His charming etchings of birds far outnumber those of animals

an exasperatingly timid bird to know that stalking wild creatures in their habitat is a far different story than sketching an obligingly stationary landscape. To get his models biologically perfect, the artist spends months—even years—exploring the woods, while in transferring to copper the mysticism of a flock of wild geese outlined against the sky or an animal's habit of mind, he must be not only a superb etcher, but a profound student of Nature in all her moods.

This is the heyday of etchings. It is interesting to know that they are made by drawing pictures on the wax-covering of a copper plate with an etching-needle, the design being produced by subjecting the copper to acid which eats out the lines traced with the needle. The etchings are impressions which are taken from the etched plate.

"The earliest thing I can remember", says Will Simmons, in speaking of his early fondness for studying animals, "was an attempt to carve animals on the kitchen furniture, then came my fascination for Darwin's 'Origin of Species'—and this I have never outgrown. It was without avail that my parents sent me to schools, to college, even to the Paris Academy—I shirked everything to spend my time at the Natural History Museums". Characteristically, he added, "I'm afraid I still do". In his art he aims to act as spokesman for our myriad creatures and endows them with personalities. He works in various media—paint, ink, bronze, etching and drypoint.

In Fugi Nakamizo's fatherless boyhood, he felt a bond of sympathy with wild creatures that has stamped itself upon his art. Expressing his philosophy of Nature, he says, "I can not help thinking that the life of birds and animals, contrary to the views of human beings, is that of happiness, enjoying the great gifts from Nature". In "Chums Among Geese" he has placed the two birds with unerring symmetry, thereby revealing his power of observation and artistic skill. The picture has a spiritual quality that is indefinable. He also paints wild life and landscape. His etchings of wild life have been exhibited and enthusiastically received throughout this country.

Benson B. Moore, an artist of refreshing versatility, is a native of Washington, D. C., where he studied at the Corcoran School of Art. He has always delighted in etching animals and birds, his anatomical structures and portrayal of wild life character being flawless. His paintings are of landscapes

"Kadiak Bear"

by Benson B. Moore

The collection of Benson B. Moore's etchings of the wildest of the wild birds and animals, is fascinating in its variety. Skillfully he draws their bodies, accounting for every part of their intricate structures. Because glimpses of wild creatures in the out-of-doors are insufficient for detailed observation, he also spends hours in Washington's Zoo, tirelessly sketching his models in every conceivable mood and pose. The best of these sketches he makes into etchings. In "Kadiak Bear", so called from the home on Kadiak Island, Alaska, one can see how cleverly he conveys the sense of lazy tranquillity—the slow, sinewy movement indigenous to these grizzled northern warriors.

An inveterate enthusiast of the outdoors, Percival C. Wharton used to sketch wild life for diversion. As a result of the widespread popularity of his etchings, he now devotes himself exclusively to their production. Irresistibly he depicts the romance of the great flocks, a notable example of which is "Canada Geese"

"Canada Geese"

by Percival C. Wharton

His tendency to specialize in portraying that persecuted family, the owls, gives Henry E. Tuttle of Groton, Massachusetts a place among etchers peculiarly his own. Heretofore etching has been with him an avocation, but now he plans to devote all of his time to it. He has sketched birds since early boyhood

With his fine instinct for design, it is apropos that the flight of wildfowl should be Percival C. Wharton's leading art motive in his etchings that so definitely suggest an unvarnished conception of the outdoors. Mr. Wharton would have art serve the cause of conservation. "Our wild animals and birds, trees and streams will all go", he says, "if our generation does not work together in protection, and only pictures will be left. If pictures could be shown to young people and enthusiasm for wild life be aroused in the coming generation, then there is a chance". And this also voices the thought of the other artists here.

Frank W. Benson's etchings of the wildfowl of our American seacoast are his most popular. Picturesque Salem, Massachusetts is his birthplace and has always been his home. He studied at the Museum of Fine Arts, Boston and the Academie Julien, Paris, thirty years elapsing before he took up etching, in 1912

"Young Wisdom", by Henry E. Tuttle

"Going North"

by Frank W. Benson

Henry E. Tuttle is exceptionally interested in getting the artistic best out of his medium, so that his workmanship may be technically unhampered in expressing himself. He pictures exquisitely the gorgeous plumage of our large feathered denizens —"Young Wisdom" testifies to that. There is a smile in his delineation of this young horned owl's pristine dignity. Fortunate it is that the universally ignored beauty of the owl did not escape this etcher. Mr. Tuttle has spent every summer since he was eleven years old on the shore of Lake Superior, there making friends of wild creatures and etching them.

Independently of his fame as a painter, Frank W. Benson has attained international prominence for his etch-

(Continued on page 62)

Charles E. Heil, the only etcher portraying our passerine birds, made his first bird sketches when a child of four. Having studied and sketched his feathered friends in the woods, he presents them convincingly, endowing them with individuality. He is a native of Boston, but now lives in New York City

"Young Chickadee"

by Charles E. Heil

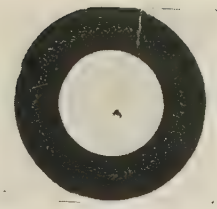
Carl Rungius was born in Germany. After studying painting in Berlin, he came to America at the age of twenty-five and for thirty years has been painting American Big Game. Three years ago he took up etching. "Stampede" reveals his ability to penetrate the inner consciousness of animals

"Stampede"

by Carl Rungius

Courtesy Harlow, McDonald and Company New York City

PUNKIES



ONE PUNKIE
NATURAL SIZE

(Below) The same fellow magnified fifty-four diameters. Science knows the insect by the name of Culicoides sanguisugus Coq. Man has called him many things, some unprintable

Meet the "No—see—ums"

by Charles Macnamara

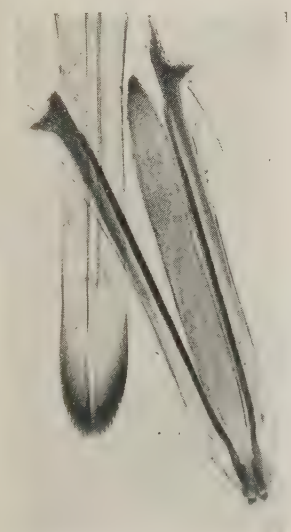
OLIVER GOLDSMITH, in his poem, *The Traveller*, commiserates his fellow countrymen compelled to emigrate to America;—"Where beasts with man divided empire claim, and the brown Indian marks with murderous aim".

Which lines show that Oliver Goldsmith never lived in the backwoods of America himself. Otherwise he would have discovered that neither Indians nor wild beasts were the emigrant's worst enemies. True, in his day Indians may still have been an occasional menace to the outlying settler; but there never were any really dangerous animals in our forests. Despite newspaper stories, no American wolf ever attacked anyone; the lynx is about as dangerous as a domestic tomcat; and the first thought of a bear or a puma on meeting a man is how to get away. The real affliction of the pioneer was then and is now,—flies, mosquitoes, blackflies and punkies.

All these pests belong to the great insect order of two-winged flies or Diptera. Of the three kinds, the mosquitoes are the worst and the most familiar, and they are the most familiar because they are the worst. At certain seasons very few country places are free from them, and they bite day and night, indoors and out. Blackflies are not quite so common, as they occur only in the vicinity of running water. They do not bite at night or in the house. I remember a general store in the northern woods with the windows covered inside with swarms of blackflies, forever walking up and up the panes, but paying no attention to the people in the store. Step outside, and in a few minutes ones' neck was bleeding from their bites.

Punkies are not so well known as either mosquitoes or blackflies. Their appearances are not so regular, and their season is not as long. But on acquaintance they create just as unfavorable an impression as the others. They are very small. The Indians of Maine call them "no-see-ums", and they are often known as sandflies, implying that they are no larger than a grain of sand. Their minuteness only increases their powers of annoyance, for it enables them to pass through the mesh of ordinary fly screens about as easily as a man walks through a doorway. Mosquito netting is no protection against them, and they are reputed to burrow through the heavy woolen blankets used in lumber camps.

Canadian river drivers, sleeping in the open, sometimes moisten the outside of their blankets, so that the water film between the threads will keep the flies out. Sleeping in damp



A PUNKIE'S LIPS

They act as guides for the saw and gouge of the little beast when he takes a juicy bite of you

SAW AND GOUGE

The mandible and the maxilla of the punkie magnified 770 diameters. Very effective formation

blankets is not generally considered a hygienic practice, but the drivers would sooner take the chance of pneumonia than the certainty of punkies.

Their bite, surprisingly severe for so small an insect, seems out of all proportion to their size. But when we examine them under a microscope the secret is out. Minute as they are, they have wonderful tools for cutting into their victims. First notice that the head is nearly all taken up with a pair of compound eyes, enormous for the size of the insect. Projecting from these are two long antennae springing from bulbous bases. They look like beads strung on two flexible wires. The mouth parts form a kind of beak or proboscis, on each side of which is a fleshy feeler or palp. Magnifying the proboscis still more, we see that it is enclosed in a soft sheath, and when we push this aside, the real cutting parts are disclosed. The chief instruments are two fine saws (the mandibles) that work between a pair of flat plates which may be regarded as the modified lip of the insect. The plates are toothed at the ends and serve to guide the saws in cutting into the flesh.

THE BEAK OF THE PUNKIE

The soft sheath is pushed to one side. Note the saw projecting from the point of the beak. The magnification is 570 diameters

There are, in addition, two gouges (the maxillae), also toothed at the ends, and their upper parts rolled into a tube through which the blood of the victim is sucked up. It is likely that a poison is injected into the wound to keep the blood from thickening, for the bite causes considerable irritation. The more fortunate of the human victims get off with a rash of small red spots that burn and itch. Others develop pustules like those raised by poison ivy.

The punkies from which the accompanying photographs were made were brought to me last July by a traveler in northern Quebec. He had stopped overnight at the house of a friend on the Kipawa River, and on going to his room, found that the lady of the house had thoughtfully lit his lamp, and turned down the bed covers. The light had attracted the flies, and they had come through the window screens in thousands. They were all over the lamp and the table, and were particularly thick on the white sheets of the bed. The thirty odd specimens, brought to me flattened out in an envelope, the traveler avers he collected by wiping them at one time off his arm in a single stroke.

GRASS that GROWS OUT LOUD

Listen to it on a Warm Spring Day

by G. G. Nearing

If you wish to try an unusual experience, find a clump of eulalia,—*Miscanthus sinensis*,—on the first really warm day of spring, when the trees are leafless, the ground bare, and the thermometer hovers between 70 and 80. Then stand quietly and listen to it grow.

You will soon hear a sharp click among this hardy tall-plumed plant that grows on lawns in all parts of the country. It will sound as loud as a snap of your fingers. Again you will hear it,—and again,—perhaps several times a minute. If you are near several clumps, the snapping will be at times almost incessant.

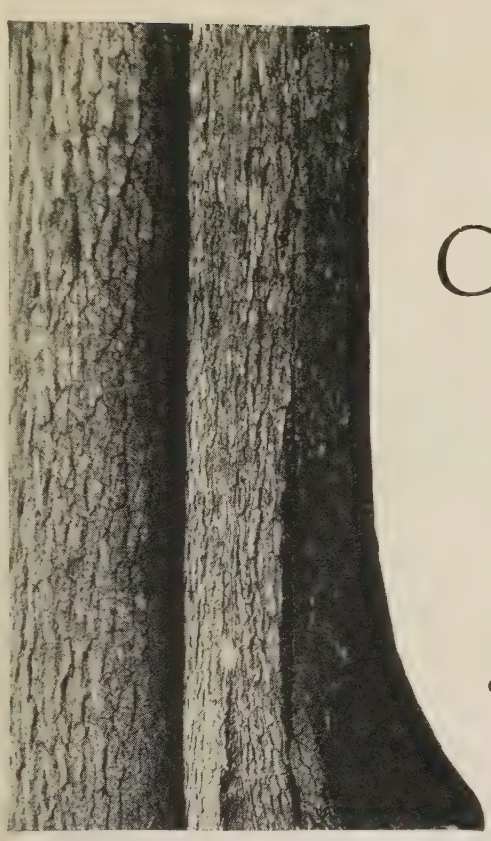
LISTEN NOW!

A sharp click warns that youth will not be denied, and that new grass is born

At first it seems unnatural. You might wonder if the ants have invented cannon, or, if you believe in fairies, whether they are typewriting notices of your presence.

But the fact is simple enough. New shoots are trying to push between the stalks of last year, and the flinty hardness of the dead culms holds them back. Youth will not be denied. The shoots shoulder their way between the bases of the old canes, expanding quickly in the spring sunshine. The strain increases until the old wood gives way with a snap. New grass is being born.

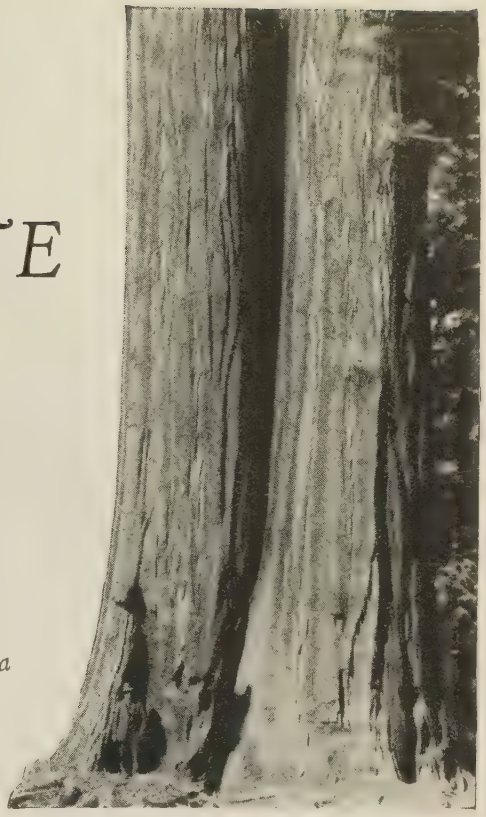
Thus can you really hear the grass grow in spring!



CLIMATE and TREES

by A. E. Douglass

of the University of Arizona



NATURE knows many languages. Like the Sibyl, she has scattered the story of the world as leaves for the winds to carry to all parts of the earth. Sometimes even the savage can understand her, when she reveals herself in the voice of thunder, the crash of the surf, or the rumble of earthquake. At other times she talks in parables—in the raised beaches of San Pedro, the fossil trees of Calistoga, and in the great twisted tangles of the rocks, which tell in their upheaved layers of sandstone, granite and feldspar of long æons of heat and cold and change. For those who listen with fine instruments, she whispers of microscopic smallness, of electrons and of minute forms of life; and even from the distances of whirling nebulae and wandering comets her Babel of tongues speak out their message. And I have been learning still another of her languages—I have been studying the dialect of the trees. For it is partly through them that she relates the history of the climate of the past.

The annual rings in trees and the grain in lumber are really the scars of severe winter weather which caused a cessation of growth for a time, a husbanding of energy to fight the cold. Each succession of the light and dark parts which make up a ring reveals one year's happenings. The soft, light section is the spring growth, and is large and porous to carry the sap upwards, but the late summer and autumn growth is dark, hard and pitchy, strongly designed to give the tree strength to prevail against the winter winds and the attacking ice-gnomes. In the lands where the winter snows are abundant and the summers short but warm, the great contrasts in weather have caused the account of climatic changes to be writ large in the rings of the trees, especially in those of the cone-bearers, but in localities where seasonal differences are slight, as near the sea coast, spring, summer and autumn rings merge.

THE RINGS TELL

The light section is spring growth, while the dark that of fall. Together, they reveal one year

Humankind always has one topic to discuss, the weather. This community of interest has saved many friendships, and prevented innumerable arguments. Trees, likewise, record constantly their impres-

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TONGUES IN TREES

Wherever the climate has been the same, trees resemble each other, though sometimes hundreds of miles apart

sions of what the elements are doing by varying the amounts of their growth in response to rain or snow or heat. It is easy to prove this truth, for we find even in great forests that in any given year all the trees take on just about the same amount of avoirdupois. Yet the only constant factor over these large areas is the climate.

There are great forests of pines covering the slopes of northern Arizona and parts of New Mexico and Colorado, and trees in all sections recite in unison the same narrative of past events. In 1904, for example, they grew but little, and the rings were thin, but in 1907 and 1909 they waxed fat and flourished as one. The Giant Sequoias in Calaveras Grove reveal the same facts as their brothers at King River and Springville, hundreds of miles southward. It is not merely that American trees are better trained as Nature's stenographers than natives of other lands. In Sweden twelve different trees were picked at random from a river-full of floating logs, yet the accounts they gave of their growth varied hardly a millimeter. Thus does Nature tell the tale of her fickle offspring, Climate, in her fashion.

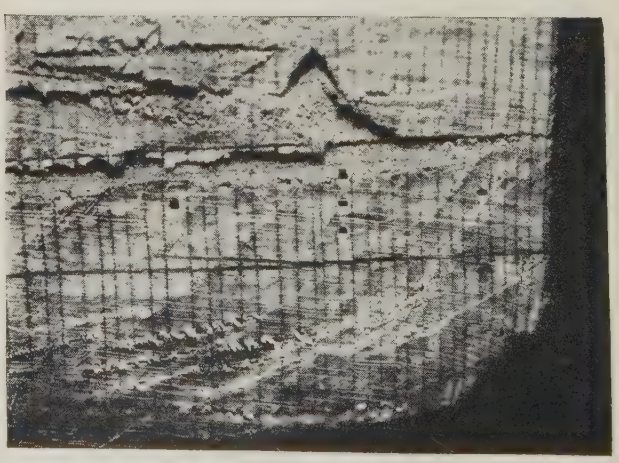
Trees that are separated by great distances, however, do not speak exactly the same, any more than do provincials living in different sections. Though the Mt. Wilson, California pines resemble somewhat those of Arizona, they do not impart the same information. Perhaps differences in temperature or in growing season cause these changes in the text; or perhaps it is fog. It may be a question of the effects of different soils, or of varying humidity. Yet even when the records are confused and jumbled, certain facts shine out to indicate that the climate is much the same for these two regions.

In the dry parts of the Southwest, there is a constant struggle for life going on among the trees,—a struggle against lack of water. In wet years, the rings are large, pointing out how quickly the conifers take advantage of the opportunities to prosper; but in dry years, when only by strict conservation can feeble life be kept going at all, the rings are tiny, and sometimes entirely absent. Thus can man read, "two years ago was wet, but forty years back, the trees suffered from great thirst".

Not infrequently do trees in certain sections of different states resemble each other closely in their habits of growth. On the hills of northern Arizona, at Prescott and Flagstaff, the tree rings tell without hesitation or confusion of the rains of the preceding winter, and as these winter rains vary like those in Southern California, these same trees inform of climate in a region hundreds of miles away. The northern California trees, however, are affected by a different climate, and reveal nothing concerning happenings in the southern portion of the same state.

Thus can we read the trees. We can find in the story of their rings the records of climate for hundreds of years. We can learn of ancient rainfalls, and judge, perhaps, the future by the past. Engineers may grow to understand the dialect that Nature has spoken, and prepare their reservoirs and dams according to the predictions which the trees make. Science has secured another handmaiden.

Here are some of the facts the trees have disclosed already—yet they have only begun to talk. The Arizona forest monarchs tell in their rings of the great drought of 1899 to 1904, and of that in the early eighties. The years 1864 and 1851 were very dry over all the Southwest, they say, and human memory corroborates them. They advise that there were sultry, dry periods during 1822-23, 1778, 1748 and 1684-6. They have not lied. For five centuries they have kept their accounts faithfully and well, like good servants of Nature—they have been her monkish penmen, writing as she dictates.



HERE THE RECORD

The story of sunspots, drought and rainfall, of fat years and lean, is marked in the rings

The giant redwoods in the high mountains are just beginning to yield up their long hidden records, and already they seem to indicate that some factor other than rainfall is affecting their growth. Perhaps they will show man the great forces which go to make up climate, perhaps through them, and

her trees, he can learn how to control the weather, and .d great strides to his progress.

l It was a desire to discover some causative factor be- nd the rainfall that sent me to the trees in quest of her information. I wanted to know more about the rs, or at least about one of the stars, the sun, which is nsidered to play havoc with the climate of little earth. seemed logical that if the trees could record the rain- ll, they also must contain the secrets of heat and radi- ion coming from the sun. I first tried to trace the riodic eleven year recurrence of great sunspot activity. any misgivings accompanied the work, for the proba- ilities of error were innumerable. Tree after tree was amined. Charts were made out. Data were accumulated. d when the maze of figures and facts settled down, ere stood a five hundred year record of the sunspot cy- , faithful, accurate, in accord with the findings of ence with but one exception. The period from 1650 1725 was barren of results. Every attempt to discover rough the trees that sunspots had erupted with their ll-known regularity during these years failed flatly. ry discouraging. And it was not until three years ter that an English astronomer, Dr. E. W. Maunder, vealed that the sunspot records prove clearly a great arth of sunspots during 1645 and 1715. For some ange reason, the sun had not conducted itself with its stomary propriety during this time and man, who rks upon laws either deduced or induced, had not dis- vered the lapse. The faithful trees, however, who take wn only what is given them, and draw no conclusions, d recorded the aberration truly and well.

Since it is easy to recognize definite years through dy of trees, human history can sometimes be laid bare reading the story of the rings. They record, perhaps, e date of a carelessly set fire, or a thinning or draining a forest, or a flood. Sometimes they can decide certain estions of ownership. And the key to the knowledge y reveal is being carried to prehistoric ruins by Neil . Judd of the United States National Museum to dis- ver the relative dates of the timbers of which the tem- es and homes of bygone races were built. The trees will ow how long it took to construct some of the great com- unal dwellings and at what intervals different build- gs were erected. Perhaps in the future a comparison of e story of these timbers th that of the great se- oias will reveal the age the ruins themselves.

We must look to the st to predict correctly e future, however. It is the role of weather-fore- sters that trees may be reasure chest for science. here are minute investi- tions being carried on by e Carnegie Institution d the University of Ari- to make these arbo- l graph sheets into ical aids for human- d. I have measured one hundred and

OLD CLUMPY ZEB

Perhaps through him and others, the causes of climatic change may be revealed, and the future seen

H. H. DUBOIS

SEQUOIA SHADOWS

For long centuries Nature has talked to these trees in her dialect, and they have marked her words

fifty thousand tree rings, and constructed a cycloscope or periodograph to help decipher the strange hieroglyphics of the Nature dialect. Out of the mass of variation and confusion of records loom, it seems, a few cycles which appear to have relation to changes in the sun, and scientists everywhere—Clayton and Abbot in Washington; McEwen and the astronomers at Mt. Wilson in California—are beginning to forge powerful links in the chain of causation by which great forces are controlling the weather. Just the preface of the story of the rings has been read—the body of this modern Sibylline book has yet to be construed. And perhaps when it is done, not only the record of the past, but part of that of the future, may be discovered to human beings, and weather be predictable.

Man has studied many of Nature's tongues. He has broken from her by his effort and his instruments some of her secrets which she has written down in her thousands of diaries over the face of the earth. Much yet lies hidden. But enough has been laid bare to show that man can always find

" . . . . tongues in trees,
books in brooks,
Sermons in stones, and
good in everything".

ARBOR BEAUTIFUL
And well worth the trouble. You must now clip off faded flowers, and soak well the baked soil
H. ARMSTRONG ROBERTS

HINTS and HELPS
for Home and Garden

July

by Harry R. O'Brien

NOW COMES the time of year when the faith slackens, the will weakens and the hopes of balmy spring disappear as the blistering sun sears the grass, leaves drop, fox grass sneaks ahead and rag weeds shoot up. It's easy to garden in spring—and quit gardening in July.

* * *

July is probably the hardest month for gardening, unless it is August. But it is the time when the real gardener does not falter. The weeds should be kept down, the ground around the perennials in the border needs stirring. Things which have bloomed earlier should be trimmed out. If the ground gets too dry, water,—but soak, don't sprinkle.

* * *

Gardeners who have clay soil that bakes hard as a brick in midsummer might find this method helpful. Just as soon as the ground can be safely worked after a rain, stir it up with a hoe before it has a chance to bake and then keep it stirred about once a week. If it bakes at any time, wet it thoroughly with the hose then the next day use the hoe.

* * *

Of all the tools in the gardener's arsenal, the most valuable for July and midsummer is a little hand cultivator or fork hoe. It has a short hoe handle with four tempered steel sharp prongs instead of the hoe proper. You work it by drawing it through the ground toward you. In stirring up the ground, you can work almost as fast as you can walk and stir perhaps four or five times as much as you could with a hoe in the same time. Nurseries make constant use of this tool. It sells for a dollar or so.

* * *

July is a good time to begin to get ready for fall planting of roses—which is the best time for such planting. Begin by seeking information and reading up. The Conard-Pyle Company, nurserymen, of West Grove, Pennsylvania, have a little book, "Success With Roses", that sells for twenty-five cents. The rose catalog of Bobbink & Atkins, Rutherford, New Jersey, contains some valuable information. Farmers' Bulletin No. 750, "Roses for the Home", by the United States Department of Agriculture, is free for the asking and helpful. "About Roses", by Prof. Alfred C. Hottes of Ohio State University, has recently been revised as Bulletin No. 71, Agricultural Extension Service, of that institution. This is free and also very instructive.

DON'T WEAKEN
Easy to quit on hot days, but only care will grow these dahlias, or such a garden
H. ARMSTRONG ROBERTS

SHE LOVES ME

Daisies riot on July days, and wise is the gardener who includes them in the flower scheme

H. ARMSTRONG ROBERTS

Every grower of roses should have on his bookshelf "The American Rose Annual", issued by the American Rose Society and edited by Dr. J. Horace McFarland. This volume can be secured by joining the American Rose Society, which costs $3.50 a year. Checks should be sent to Robert Pyle, secretary, West Grove, Pa. Back numbers of this annual may be secured at prices ranging from $2 to $5.

* * *

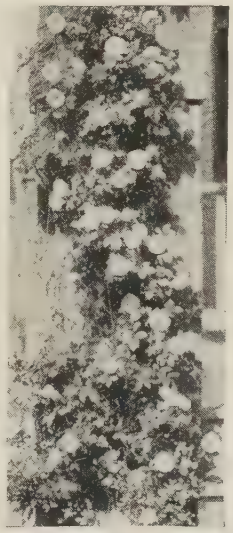
One of the blessings of a country home where electricity is available is the water softener. Some now on the market are automatic and need no attention except to put in a bag of salt, as needed. One hundred pounds of this lasts from six to ten weeks. Home owners in cities with hard water often install a home softener also.

* * *

Clipping off faded flowers and preventing the forming of seeds is essential for prolonging bloom of many perennials. This is especially true with gaillardias, coreopsis, pansies, and others with long bloom period.

* * *

Don't delay the pinching out of the tops of chrysanthemums. This causes the tops to spread and give a bushy plant with much more bloom in the fall. For moving clumps, use a steel trowel with five or six inch blade.



If you have some annual plants left in the seed bed still, perhaps there are bare spots among the perennials that could be filled in with them.

* * *

A new insecticide for use against the Japanese beetle was announced recently by the United States Department of Agriculture. This is a miscible carbon disulphide. It is as effective as carbon disulphide emulsions for killing the soil-infesting stages of the Japanese beetle and in addition has certain physical and chemical properties that make it superior in some respects to preparations previously used.

* * *

Gas in drums is now available for use in country homes not reached by natural gas mains. This gas is casing head gas from oil wells. It has a higher heating quality than ordinary natural gas and less carbon in it. Several firms supply this gas and the necessary equipment.

* * *

Right now is the best time for buying iris or for dividing and resetting varieties already in the garden. For those seeking information on iris propagation, Farmers' Bulletin No. 1406, United States Department of Agriculture, entitled "Garden Irises", will be helpful.

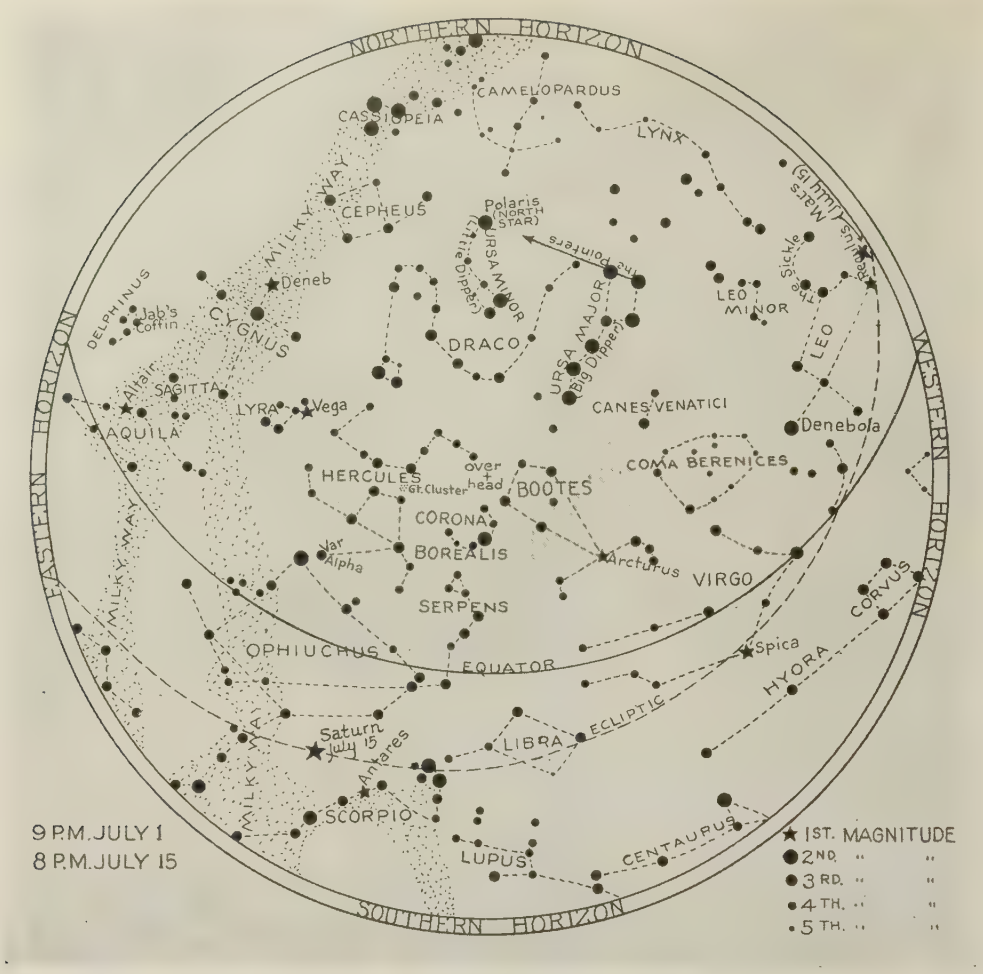
* * *

Three Farmers' Bulletins of the United States Department of Agriculture that ought to be in the hands of every beginner in gardening are No. 1171, "Growing Annual Flowering Plants"; No. 1381, "Herbaceous Perennials"; and No. 1485, "Insect Enemies of the Flower Garden". Two handy appliances for fighting insects and diseases are hand sprayers and dusters. They are absolutely necessary to success and beauty.

JUNE BRINGS ROSES

But July is the time to study up for fall planting, if you wish such as these

L. W. BROWNELL



TO USE, HOLD OVER HEAD WITH TOP TOWARD THE NORTH

OPHIUCHUS *and* SERPENS

Two Important Constellations Now Visible in the Southeast

by Isabel M. Lewis

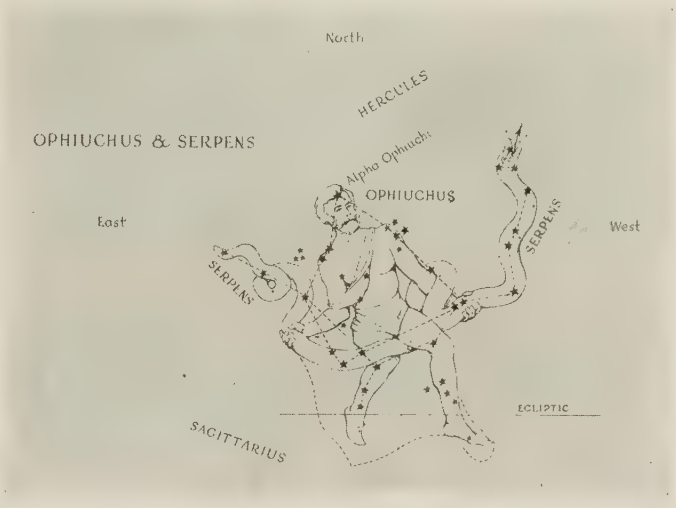
MANY star-gazers seem to find difficulty in locating Ophiuchus, the Serpent-bearer, and Serpens, the Serpent. Possibly this is due to the fact that they contain no brilliant first magnitude stars and have no peculiar or distinctive form such as make many of the constellations easily recognized, as, for example, The Dipper in Ursa Major, The Sickle in Leo, or the kite-shaped configuration in Boötes.

Although Ophiuchus and Serpens are closely associated, their outlines are entirely distinct and their boundaries clearly marked so that there is no confusion in naming or identifying the individual stars of each. There is only one star in either of the two groups that is brighter than the third magnitude and that is Alpha Ophiuchi, the star in the head of Ophiuchus, which lies only a few degrees east of Alpha Hercules, a third magnitude star in the head of Hercules. In addition to this second magnitude star, Alpha Ophiuchi, there are eight stars of third magnitude in Ophiuchus and four of third magnitude in Serpens, also a number of fourth magnitude stars in both groups. Probably the most noticeable feature of the two groups is the arrangement of some of the brighter stars in pairs, as, for example, in the right hand and on both shoulders of Ophiuchus. If one has difficulty in tracing the outlines of the two groups it will be helpful to remember that they lie south of Corona Borealis and Hercules and north of Scorpio and Sagittarius. The head of Serpens lies directly south of Corona and is marked by a triangular group of fourth magnitude stars. From here Serpens extends first directly southward and then sharply eastward to the pair of third magnitude stars in the hand of Ophiuchus, across the latter constellation to a second pair of stars in Serpens and then in a northeasterly

irection as is clearly indicated on the chart and on the epresentation of the mythical figures.

In the most generally accepted legend Ophiuchus is dentified with Aesculapius, the son of Apollo, who was amous for his marvelous healing powers which included, it was said, the ability to restore the dead to ife. This led Pluto, god of the lower world, to fear and islike him and he persuaded Jupiter to destroy him ith a thunderbolt. It was through the insistence of pollo that he was finally granted a place in the eavens. In ancient times the serpent was always associated in thought with ealing and concoction f healing potions and is probably for this eason that Ophiuchus s represented as holding the serpent, the ymbol of great healing owers, in his hands.

The eastern portion f Serpens and Ophiuhus is crossed by the ilky Way, which is xceptionally beautiful n the vicinity of Theta phiuchi, the third agnitude star in the ot of Ophiuchus. This onstellation has been articularly favored oth by novas and mets. The great Nova of 1604, known as Kepler's tar, was one of several to appear in Ophiuchus. Although this constellation is not included among the odiacal constellations the extent of the ecliptic in phiuchus is greater than it is in Scorpio, and it includes more of the zodiacal belt. During the interval om Nov. 21 to Dec. 16 each year the sun remains xteen days in Ophiuchus to only nine in Scorpio. ikewise the moon and planets, as well as the sun, are n Ophiuchus for a proportionally longer period than ey are in Scorpio. The equator as well as the ecliptic asses through these two groups and they are seen almost qually well in both hemispheres.



IMPORTANT CONSTELLATIONS

Ophiuchus, great doctor, and the serpent, the symbol of healing, whom the gods placed in the skies

A noticeable configuration in the eastern sky in the vening at this time of year is the nearly equilateral iangle formed by Alpha Ophiuchi, Vega and Altair. he Northern Cross in Cygnus is now conspicuous in ie northeast and the Milky Way spans with one branch ie eastern sky from Cassiopeia in the north through ygnus to Aquila and Sagittarius, and extends to phiuchus and Scorpio with the other.

Corona and the head of Serpens will now be found irectly on the meridian with Hercules directly to the ast and Boötes to the west of the meridian. Scorpio is onspicuously visible in the south and Virgo in the outhwest. In the northern sky Draco is now seen to ie best advantage. Its head is beneath the foot of Hercules and near the meridian in the northeast, and its ody winds around the two dippers in a general esterly direction to a point nearly midway between ie Pole-Star and The Pointers, where a fourth magniude star marks the tip of the enormous creature's tail.

Saturn is now in fine position for observation in the evening sky in Scorpio, a few degrees northeast of Antares. It is about equal to Vega and Arcturus in brightness and is yellowish in color, contrasting strongly with the decidedly reddish Antares. Its rings and satellites may now be seen to excellent advantage in the telescope and it will remain visible throughout the greater part of the night.

Venus reaches superior conjunction with the sun the first of July and will be invisible until near the end of the month when it may possibly be seen low in the west directly after sunset.

Mercury will be at its greatest distance west of the sun on the twentieth and may be glimpsed low in the northeast in the morning twilight for a few days about that time.

Mars is now in Aries and rises soon after midnight. It will be easily recognized by its ruddy color and by its brightness, which is now equal to that of a first magnitude star. Jupiter is also in Aries this month and the two planets will be in conjunction on July 3 when Mars will pass south of Jupiter at a distance of about one-half the angular diameter of the moon.

July is also the month in which the earth is in aphelion or at the point in its orbit farthest from the sun. This occurs on July 4 this year, at which time the distance of the earth from the sun is 94,451,000 miles.

This month, also, the moon will occult, that is, temporarily hide from view for a short period, the bright second magnitude star Sigma, the star farthest north in the bowl of the little inverted milk dipper which is the most conspicuous group of stars in Sagittarius. Occultations of stars by the moon are common occurrences but occultations of bright stars or planets under favorable circumstances are comparatively rare and they are phenomena that are always interesting to observe, since the star disappears from view with startling suddenness as it reaches the edge of the moon and reappears an hour or so later with equal abruptness.

At Washington this occultation will last one hour and fourteen minutes. The disappearance or "immersion" of the star, as it is called, will take place at 9:27 p. m. eastern standard time at Washington and the reappearance or "emersion" at 10:41 p. m.

An occultation, like an eclipse of the sun, is visible only within certain limits. The limiting parallels of latitude beyond which this particular occultation cannot be seen are 64 degrees north latitude and the equator. It will be visible all over the United States and most of Canada provided the moon is above the horizon, of course, at the time of the occultation. Except in the extreme western states, however, the phenomenon can easily be seen and enjoyed by those watching the sky.

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NATURE EDUCATION

Dr. E. Laurence Palmer
Cornell University, Director

NATURE AND POETS

by E. Lawrence Palmer

Nature poems and poets have been praised unduly and also are denounced with equal injustice. This article is not concerned primarily with the poetic value of Nature poems, as the writer does not feel qualified to pass upon the merit of poetry except as it is satisfying to him. Innumerable phrases snatched here and there from poetry, however, have helped define so many vague concepts that it was felt they should be shared with the readers of this page.

It was the original intention that this article should be entitled, "Through the Eyes of the Poet". As the material accumulated it was evident that poets expressed in words the evidence supplied them by all their sense organs. It was also evident that many with ability to select and group words had not sufficiently trained senses to see things in Nature as they are. It is probably as true that there are as many trained naturalists that are not poets as there are relatively successful poets that are not trained naturalists. One needs to glance through few standard treatises on Nature to come to the conclusion that those writing them lack the poet's power of expression. The text writers have not the excuse that brevity demands their sticking to the subject since frequently the poets picture in a few words that which the text writer might use whole sentences to describe. Even those who describe new species and pride themselves on their brevity fail to record characteristics of great value which the poet may give.

A poem just published in 1928 is possibly the immediate cause of this article. It was written and sent by a reader of this page and records concisely nearly five hundred of the things in Nature which have seemed to be most genuine. To the writer's knowledge many of these have not before been recorded in poetry and many certainly are not recorded in scientific books of reference. At least if they are recorded in texts they lack the charm given by the poet.

To be specific, Gray's Manual speaks of the fruits of *Clintonia borealis* as "berry ovoid, blue". The poet tells a better picture of the color in "The rare blue of Clintonia berries". We can search the manual for a description of the opening of the fern frond and should we find it, it would not equal in conciseness and accurate description the poet's "crosiering of Christmas ferns". The manual is possibly more accurate when it describes trillium as having a "Whorl of 3 ample, commonly broadly ovate, more or less ribbed but netted-veined leaves" but some of us at least get a unique satisfaction from the "wake-robin's Trinity sign".

Some of the other phrases which seem to be unique in this poem must be given here:—

"The lure of far away places, the pattering of little feet,
The daintiness of lacewings and the pointing of meadowsweet".

Still others, not in their natural setting are, "the friendliness of kingsnakes, the sensitive horning of snails, the antiquity of horse-tails, the gleaming of syrphid flies, the dogbane beetle's splendor, the short, light step of goats, the thorobred's lack of a whine". In the field of physical science we read of "the shattering of stars by rills, the diffusion of heat by copper, the double triad of perfect snowflakes, the fascination of caves and the happy brook's little plubs".

It is possible that poets shine best in their description of human thoughts and feeling which are not always easily assigned to any or all of the senses. Among the best in this class in the poems considered are, "the happiness just out of reach, the smallness of one's last house, the unseen guest in the home, the bear and forbear of marriage, the doing of axeless favors and the rose-petal fingers of babies".

Another poet writing of a white birch does not see the "branches slender and flexuous, often drooping" of Gray but "a white birch high upon a hill curtsey to the evening star while other trees stand still". To this young little-known poet an April night is "like a Japanese print in silver and black, the moon through poplar trees" and again "The world stands a-tiptoe beneath the moon, The world is holding its breath, Lest it frighten the wee, new growing things, the life that has come from death". Is it any wonder that to one with ability of this sort adventure is "to feel a little child clasping my hand, to go adventuring in that child's heart, some day to understand"?

Another poet who is better known now for his short stories but will be remembered longer for his poems must have had equally kindly thoughts for children when he wrote about a tenement child who

"Leaned from a window and with hands that shook
Poured water on a dead geranium and that alone was worth a wise man's book".

(Continued on page 63)

ANIMALS BELONG IN THE CAMP FAMILY

This raccoon at Wigwam was a continuous encouragement to further Nature knowledge

JUST DRY BONES

A Brief Sidelight on Camp Nature Lore

by William G. Vinal

Director of Nature Guiding for the American Nature Association

In this shorter article in his camp series, Dr. Vinal pauses to describe an incident of his camp tour for NATURE MAGAZINE. *There is a wealth of suggestion in this story, however, and we call particular attention to the last sentence.*

WE DID not go far with the Onaway girls before we came across a skeleton and feathers. I picked up a feather and some girls immediately exclaimed: "Oh, gooey!" This was an occasion for a deaf ear. Leaders sometimes need them. I told them that I wanted to see how good they were at scouting as I was going to send them on a scouting trip soon. What kind of an animal was this? "A bird" came in chorus. "A crow" answered the tallest girl in back. From what part of the bird did it come? "The wing", they said with satisfaction. How do you know? "By its curve" ventured a high pitched voice. "Good for you," I came back, "I can even tell which wing". There was a ripple of discussion at this point. I picked out someone who said left wing and asked for proof. She took hold of the feather and showed which side faced forward. So far the girls had told me that this feather came from the left wing of a bird.

We looked for more evidence. This time it was a wishbone. "You may not recognize what this is but some of you may be able to tell what it is not". There seemed to be general agreement that it was not a chicken's wishbone nor a turkey's. One volunteered the information that it was not a squab's. The only help that the wishbone gave us was that of elimination.

From the biological standpoint, or pedagogically speaking, I am not sure what should have been taken next but it happened to be the wing bones. This led to a discussion of ball-and-socket and hinge joints. The campers were all going through contortions to find their own ball-and-socket and hinge joints. They were interested in finding the bones that corresponded to their own forearms, and leg bones. Others were trying to fit together other ball-and-socket bones. At first someone wanted this bone and another that one which fitted into her specimen. It was just like a picture puzzle. Then they decided to put all the bones in a box and try to fit them together.

At this point I managed to get their attention on the finger bones. They were surprised to discover that there were relics of fingers in the wing.

Suddenly someone unearthed a bluish feather, too blue to have been the property of a crow. This eliminated the crow verdict but complicated the story.

Next a V-shaped bone came to light. This was curious indeed and meant nothing until a spoon-shaped bill was brought forth. The V-shaped bone instantly gravitated under the spoon bill like steel to the magnet. Interest was running into enthusiasm. It was a duck.

On the way home there was much speculation as to how the duck got there. Did a fox get it? No, because the bones were intact and not scattered. It must be that a hunter shot it and then couldn't find it.

The moral of the story is evident. Whether a thing remains "gooey" and uninteresting, or whether it is dry bones and interesting, depends upon the leader. There are sermons in bones if we look for them. The specimens are ready and so are the campers, very much ready. The great need is for additional Nature guides.

NATURE NEWS AND Views

Lost Children

A search for lost children of an aristocratic tree,—the ornamental tree called *Franklinia altamaha*, in honor of Benjamin Franklin and the river in whose valley it was first discovered,—is being conducted by Dr. Edgar T. Wherry, of the United States Department of Agriculture. John Bartram, early American Botanist, discovered a small patch of these trees in Georgia in 1765, and a number of them were brought to Philadelphia, all of which died, however, except one. While this tree has produced many progeny, the call has gone out to be on the lookout for trees of the same species but of different ancestry, so that the two strains can be crossed to produce new varieties.

"John Silver"

"John Silver" was a wounded, crippled quail who became the mascot of a racing stable, the favorite of the "jocks", and finally like his namesake, "deserted the ship" for new worlds. The bird was found by Sidney MacDonald in northern Kentucky. Mr. MacDonald writes: "I stowed the little cripple in my pocket, and returned to the 'place'. Showing it to a kind hearted jockey, I asked what could be done. He soothed it with rough hands more suited to bridle reins than anything else, and said we would 'nuss' it. He amputated the crippled leg and set the broken wing. 'John Silver' became lively and pert, and was elected official mascot because he wore the racing colors of brown and white. He was a pet, and seemed to know one of us from the other. One day he departed, however, and was seen no more by 'jock' or stable boy".

Another "Squeak"

Another "Squeak", perhaps a relative of the "Squeak" of whom Hugh Spencer wrote in April Nature Magazine, graced for a while the home of young Miss Mary Flower Metcalf, of East Stroudsburg, Pennsylvania, then also drooped and died. Miss Metcalf found the little orphan with broken wing along the street, and brought him home, where bread crumbs and water contented him for a while. "Bill" was the sobriquet attached in honor of his beak. Only a short time did the bird live, however, but Miss Metcalf writes: "I know it was taken care of when it needed attention".

Insect Exchange

Among the readers of Nature Magazine seeking to exchange moths and butterflies are D. B. Statler, of Arbyrd, Missouri, and Clement W. Baker, of Waynesboro, Ohio, who wish to hear from fellow collectors in the near future. Mr. Baker is interested in exchanging letters relating to all forms of insect life.

THE GREAT STONE FACE

America's eastern watchman, "The Old Man of the Mountain", has been saved by the people who have admired him. They have donated $400,000 to bring him and the six thousand acres of mountain, lake and cliff which form his kingdom under the protection of his native state. In August or early September, his domain over which he has ruled from his cliff for centuries, will be dedicated as a memorial to the soldiers and sailors of past wars, and the work of landscaping the new state park to restore its primeval beauty will begin. Chief of the defenders of "The Old Man", who has been threatened during the past few years with the loss of his coverlet of green, has been the Society for Protection of N. H. Forests, under the leadership of Philip W. Ayres, and New Hampshire women's clubs. The American Nature Association feels proud of those of its members who responded to its appeal to support the "Buy a Tree for $1 and Help Save Franconia Notch" campaign. And now the worried look has gone from the "Old Man's" forehead, since America, and his state, has claimed him for their own.

New Science

Biology as understood by some of the High School students in Harrisburg, Pennsylvania and reported by Merrill Wood of that city:

"The crop of a bird is used for self-defense."

"An albino is the white of an egg."

"An albino is an animal coming from an egg."

"The gizzard aids in fertilization."

Wanted—Comet Hunters

The amateur astronomers in America, once superior to those elsewhere in the matter of finding new comets, are losing their prestige, in the opinion of Professor Leon Campbell, of Harvard Observatory, who suggests that the dust be wiped off their lenses and they regain their honors. The big observatory telescopes, he asserts, are too busy with work for which they alone are suited, and unless amateurs discover and announce the approach of new comets, the accurate charting of their courses may be impossible; in fact, some of them may not even be seen. Twenty minutes a night, he points out, will often be enough to detect new bodies.

Socialism and Ants

While admitting that the society of ants for efficiency and development improves considerably on that evolved by man, Professor Julian Huxley of England in a recent lecture attacked the idea that human civilization is moving toward the ant-hill type, with its complete and rigid socialism controlling every action of the individual, and pointed out that while humans are born physically alike, ants are born to their life duties with different physical capacities. Soldiers have weapons, queens are especially adapted, he showed. So successful is this device of the ants, he asserts, that were they larger they might have exterminated the human species; but there is no possibility that mankind will adopt their type of "civilization".

Lake States' Timber

Progressive reforestation, restocking of cut over lands, coupled with selective, careful logging are the methods which industries and individuals must pursue in the Lake States, if the forestry problem there is to be solved, Dr. Raphael Zon, director of the Lake States Forest Experiment Station of the U. S. Department of Agriculture announces after investigation of the prevailing conditions. He finds that only 18 percent of the total forest lands in Michigan, Wisconsin and Minnesota contain old merchantable timber, while 46 percent contain second growth, and 36 percent consists of unproductive cut-over land. All of this area, which has little agricultural value, and the taxes on which are creating a difficult burden, can be made profitable, he believes, by replanting with trees, then following the latest forestry methods of controlling valueless growth, transplanting, and fighting tree diseases. Fire prevention is the key to the situation, he writes in Bulletin No. 1496-D, which covers his recommendations. Continuous, profitable yield will result.

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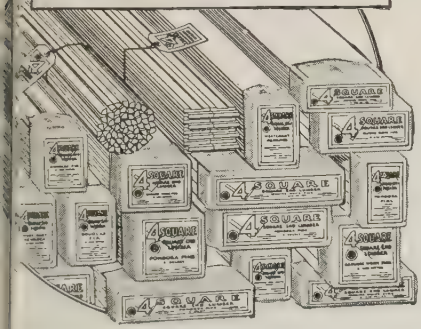

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Etchers of Wild Life

(Continued from page 48)

ing of American wildfowl. Although he etched his first plate in 1882 when a youth, it was not until 1912 that he began his real work with the etching-needle. Wild geese, yellowlegs, mallards—all the birds of our seacoast and marshes—are the subject of his charming plates. His sketches of birds in flight reveal enviable sense of rhythm, while his V-shaped flocks of wild fowl swirling through the sky appear to symbolize the spirit of America's freedom before it surrendered to high-powered civilization.

A lifetime of observing, sketching and caring for birds is the background of Charles E. Heil's etchings. "A number of my models have been helpless creatures which were unable to care for themselves", he says. "These found a haven in my workshop and paid for their lodging by posing". He explains his fascination for sketching birds as being inherent. And how true that is, for only an inherent love of bird life could inspire this impeccable etching of a young chickadee, so realistically done that one fears it will some day suddenly flutter away. Six years ago Mr. Heil took up etching which he considers a most captivating medium.

The sense of abandoned wildness in Carl Rungius' "Stampede" reveals his knowledge of the animal mind—his almost uncanny understanding of wild creatures. It vibrates with the stark elemental spirit of the wild, strangely reminiscent of the feeling evoked by one's first experience with a frenzied storm at sea—a feeling many have known but few can translate. For thirty years Mr. Rungius has spent a part of each year camping alone in uninhabited parts of the West, sketching, painting and gathering data for his celebrated paintings. Moose, caribou, bears and rams are represented in his most recent etchings.

The need for brevity merely permits mentioning some of our other etchers of wild life—Richard E. Bishop, Edwin S. Megargee, Winifred Austen and Roland Clark.

Confronted as we are by the problem of our rapidly vanishing wild life, the etching of wild creatures is a field which should not be neglected. For, as the paintings of Thomas Moran glorify our Western scenery, and those of George de Forest Brush give a pictorial story of the American Indian, so will the etchings of these Nature-lovers, in mirroring our wild life, become significant documents of American history.

Army Worm Marching

A warning against the northward drive of the fall army worm, which on occasion has invaded the Atlantic Coast states and the important river valleys in a Sherman's March of destruction, is given out by Philip Luginbill of the Bureau of Entomology of the U. S. Department of Agriculture, which has issued a special bulletin,—34-T,—on this subject. While these creatures cannot live through the winter of the North, they go there unless checked, he points out. The larval form damages the crops, while the winged adults form the infantry. Ploughing a deep furrow across their path and then drawing a heavy log along the furrow is recommended, as well as sprays, dusts, and poisons. Birds, skunks, frogs and toads help rid the South of this pest, he says.

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Nature Education

(Continued from page 58)

In contrast to this existence he pictures his own home when he says,

"I had left sunshine on my study floor, laughter behind me in a woman's eyes.

Paintings and books and friendly smiling things, the sum of which is mortal paradise".

This poet has attached a new significance to the writer for such things as "hollyhocks half grown, white-topped daisy fields" that "go marching up a glen", mooning hills with "cowls thrust back and crimson in their dress", and a little path that, like life, "stole down to the brookside like a timid, thirsty fawn".

We can't make better poets by just wishing for them but we can encourage those who have the ability to see with the eye of the naturalist and speak with the words of the poet. There are unquestionably poets who wish they were better naturalists and naturalists who wish there was poetry in their own make-up. A poet need be no less a poet because of being a naturalist any more than a naturalist need be any less a naturalist because of poetic ability. Let's encourage those who show promise in both fields at once.

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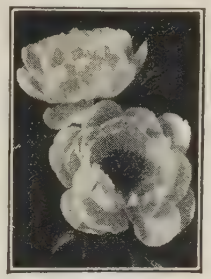

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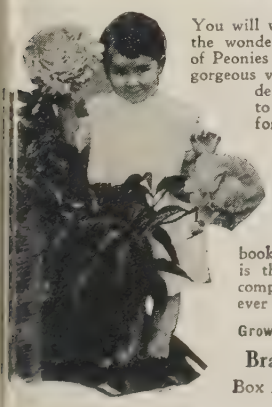

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A Bird Masterpiece

Forbush's "Birds of Massachusetts", Volume two, which has just become available at price $5 from the Massachusetts State Department of Agriculture at Boston, covers the birds of the Bay State and New England according to the A. O. U. checklist from bobwhite to the grackles.

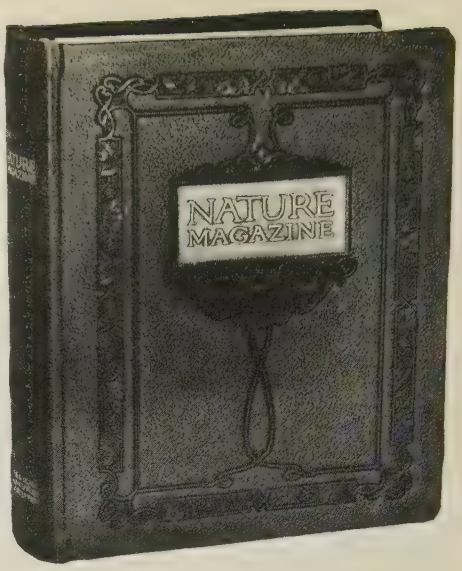
All the good things we were able to say about the first volume are applicable to this one. There is the same Forbush thoroughness and inimitable style. The work not only deals with the birds of Massachusetts, but also those of other New England states, as the full title claims. The introduction includes an account of the topography and climate of New England, the faunal areas and the reasons for the changing bird life. Mr. Forbush carefully instances the dangers of upsetting Nature's balance and what ill-advised extermination might mean to the world in an economical way. His views are worth careful consideration.

There are twenty-eight color plates by Louis Agassiz Fuertes, representing almost the last illustrative work done by that gifted artist and ornithologist. This latter fact alone makes the book valuable to bird lovers. Mr. Fuertes finished a few other plates for the coming third volume, but did not complete the series. There are also thirty-four half-tones from photographs of the nests, eggs and young of many of the species.

After Mr. Forbush, hardly an informative word can be added on the subject of these birds, and since the ones found in New England range practically all over the country east of the Mississippi, nearly half of the country is covered. We are looking forward to the third volume with pleasant anticipation.

The Story of Everest

"The Goddess Mother of the World",—that is the Tibetan name for the highest peak in the world, Mt. Everest. Expedition after expedition has sought to gain her summit, and only left a futile trail of suffering, while the "Goddess Mother", with her great influence on the superstitious Tibetans, who have tortured and killed many of those who would have conquered, has repelled all advances. Her story, dramatic, weird, is told in *The Story of Everest* by Captain John Noel, who was a member of the two expeditions sent by the Royal Geographical Society and the Alpine Club to scale the ice-cliffs and brave the avalanches. It is a tale of adventure, of struggle against the great odds of ice and snow and native prejudice, of bravery and sacrifice on the altars of age-old superstition and tradition. It can well be recommended for a warm, sunny, peaceful afternoon, under the shade of a spreading tree, where in peace and contentment one can learn much concerning men who "do things", who carve out of the heart of the wilds a path for themselves and their sci-



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Know Your Flowers

Those who look long in vain in technical works to identify wild flowers they find, or who grow irritated consulting "How to Know" books will welcome *A Guide to the Wild Flowers,* written by Norman Taylor, Curator of the Brooklyn Botanic Garden, and published by Greenberg. It lists in simple, ingenious manner more than twelve hundred species of flowers found north of Virginia and east of the Mississippi, is written in simple, understandable terms, and is profusely illustrated. Mr. Taylor, long known as editor and author, has done here a successful bit of work.

Ancient Boston

Though the Beacon Hill skyline still stands the same against the colors of the sunset, and the old State House is as it has been for a hundred and fifty years, not always has the region of Boston been the symbol of the unchangeable, according to Irving B. Crosby, the author of *Boston Through the Ages,* newly published by Marshall Jones Company. Once Boston was covered with sea; volcanoes erupted here millions of years before William Lloyd Garrison; The Great Glacier covered the site of the Cradle of Liberty, ages ago. Mr. Crosby tells in interesting fashion the story of the constant geologic changes which brought Boston Harbor, Bunker Hill, the granite of Quincy, and Back Bay to the home of Puritanism, now, then and forever. Written for the layman, the book is recommended to New Englanders who take pride in the fact that there has been nothing new since the Greeks.

About the Smokies

"The Lure of the Great Smokies", written by Robert I. Mason, and published at a price of $4.50 by Houghton Mifflin Company, is more than a geological and modern biography of the mountains which go to make up the infant National Park. It is not restricted to enthusiastic and colorful

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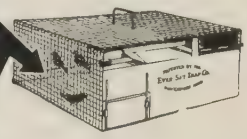

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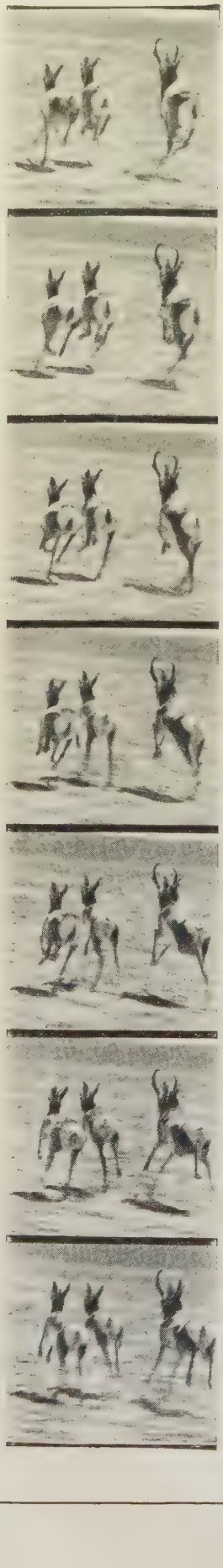

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Dates for the coming season should be arranged as soon as possible by addressing

EXTENSION DEPARTMENT
AMERICAN NATURE ASSOCIATION
15 Boudinot Street, Princeton, New Jersey

descriptions of the mountains, their flora and fauna and the glens that lay hidden in their shade, for Mr. Mason has caught the wild tone of the Smokies in his style—he has added to the natural aspects of the rugged country many touches of human nature, as portrayed by the Cherokees when they were roaming the hills, or as seen in the mountaineers, who are still children of Nature in their ways. Legends, stories, scientific facts crowd his book. It holds a promise to those who will be drawn to the new National Park; it is an hors d'oeuvre to whet their appetites.

Growing Lilies

Valuable to commercial grower as to flower lover is the bulletin *A Score of Easily Propagated Lilies,* written by David Griffiths, horticulturist at the United States Bureau of Plant Industry, and issued as Circular 23 by the United States Department of Agriculture. Mr. Griffiths has incorporated the results of years of investigation made by himself and experienced lily growers in his discussion on bulbs, climate and soils, planting, fertilizers, and cultivation. He has laid down general principles that have proved workable, although maintaining that individual cases vary and that practical experience may change standard procedure. He closes with a careful consideration of twenty well-known species, giving directions for growing and caring for them, thus making easy the road of both the florist and the person who uses the graces of lilies to add to the attractiveness of his home.

Nature Garden Guide

Among the sources of information which will make individuals, especially children, Nature-wise, is the *Nature Garden Guide,* the official organ of the School Garden Association of New York, which, published under the editorship of Van Evrie Kilpatrick, disseminates knowledge of gardening, lawn-building, birds and flowers for the benefit of the children of Greater New York. The association has as its motto: "A Garden for Every Child", and enrolls eight thousand Nature lovers.

Home Flower Growing

Home Flower Growing, written by Emil C. Volz, professor of floriculture at Iowa State College, and published by The Macmillan Company, New York, is one of those books that will decorate nearly every amateur gardener's library during the coming months. Professor Volz has had much experience with the needs of students and gardeners, and he has filled his complete and well organized book with practical facts. You will learn therein how to propagate and cultivate your plants, how to care for, fertilize, and maintain them; it will tell you how and where to grow flowers, how to plan indoor gardens, or rock and water gardens. It will help to organize garden shows and flower shows, help to run garden clubs. Pictorially the book is as good looking as it is scientifically correct and esthetically useful.

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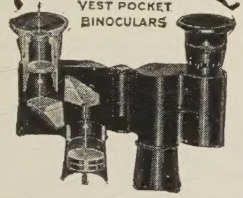

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Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature

Question: *Will you kindly inform me as to the relative intensity of the scents of various animals, particularly the raccoon, rabbit, and fox? Does the size of the foot have any relation to the scent?—W. H. J.*

ANSWER: Since the foot-scent of most animals needs the fine sense of smell of a dog, or some such creature, for its detection, it is difficult for us, with our imperfect senses, to discuss such conditions intelligently. To us the scent of the fox is by far the strongest of the three you mention, but we do not know whether or not the foot-scent of the fox smells to the dog as the body scent does to us. The foot-scents of animals are supposed to arise from the sweat glands between the toes, these parts being the principal places where such animals perspire. The whole subject seems to be a mystery, due to our inability to compare our imperefect reactions with those of the more acute lower animals.

* * *

QUESTION: *Will you please tell me how to prepare the ink that is made from the Inky Coprinus Mushroom?—M. F. C.*

ANSWER: It was first pointed out by a French author, Bulliard, in 1794, that ink suitable for writing or drawing might be made from *Coprinus comatus*, boiled in water. In the sixties, M. E. Bourdier repeated the experiments, and wrote a paper on the subject which was published in the Bulletin of the Society of Botany of France. The paper was stated to have been written with ink made seven years previously. There is also said to be a pamphlet in the Library of Congress, printed many years ago with Coprinus ink.

The addition of Gum Arabic gives the ink a better consistency, while cloves prevent molding, and also disguise any disagreeable odor. However, it all seems to be merely an interesting experiment, and of little practical value.

ROBIN HOOD

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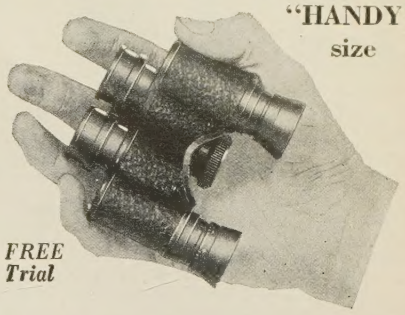

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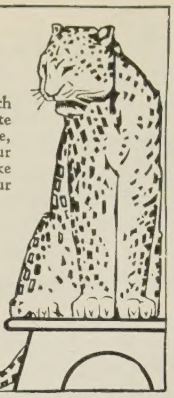

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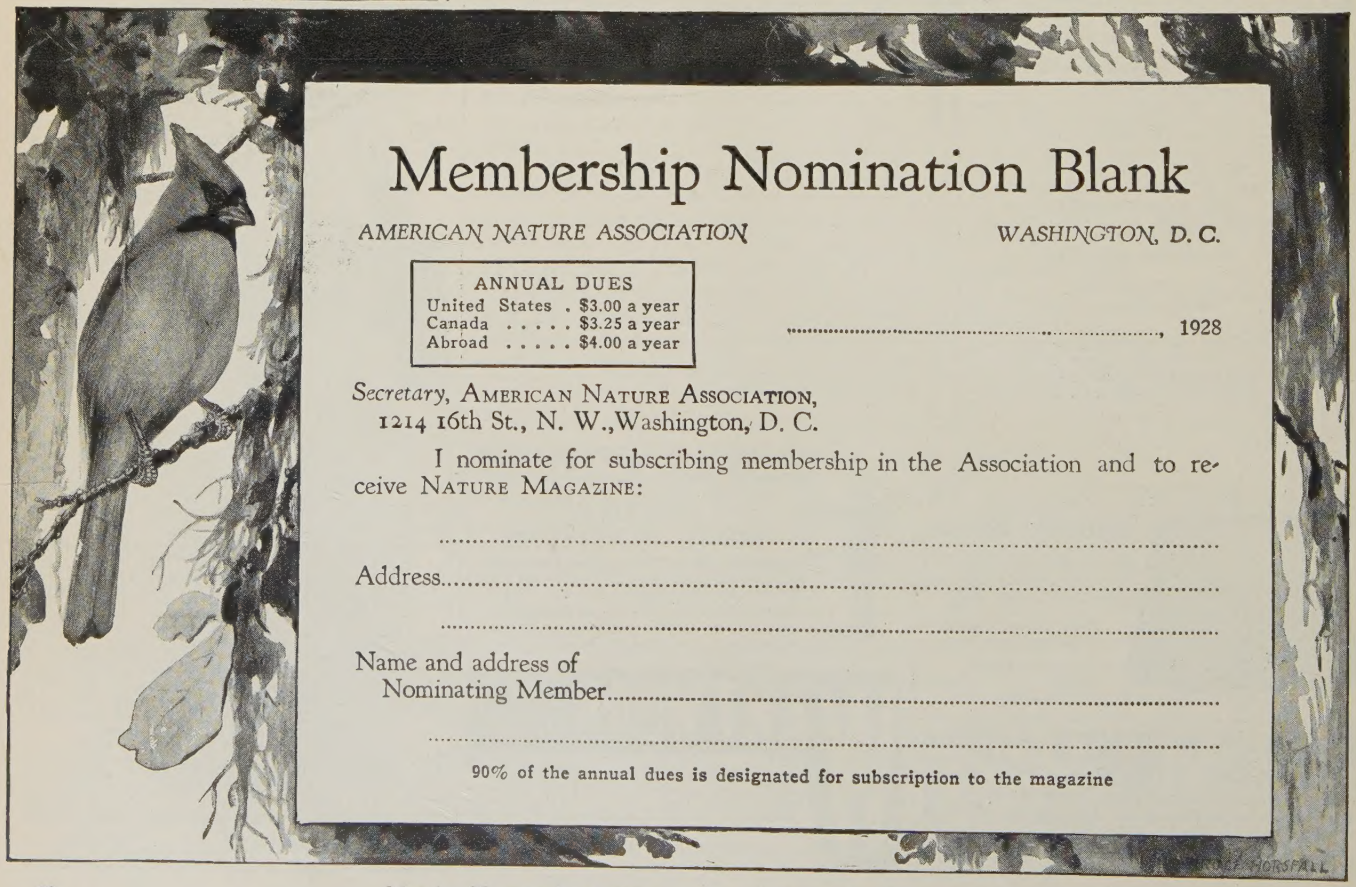

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The School Forest Idea Growing

Such Areas Place to Study First Hand the Value of Tree Planting

Now we have the school forest. The plan is being adopted to the profit of the school and the community. Here "forestry from the ground up" can be practiced by the high school student and thus another great step taken in making the nation forestry minded. An outstanding example of this movement that will be a step worth watching is that at Jamestown, N. Y.

The Jamestown Public School Forest, Inc. has completed the purchase of a 150 acre farm on Sprague Hill in the town of Poland for $1,500. Gustavus E. Bentley, principal of the Washing Junior High School, and president of the corporation which has purchased the land, makes the announcement. Officers of the Jamestown Public School Forest, Inc., are: President, Mr. Bentley; vice president, Lynn R. Van Vlack, member of the Board of Education; secretary, Leslie Vanderwarker, teacher of the vocational school; treasurer, Miss Stella Johnson, principal of the Newland Avenue school. The corporation was organized to purchase property for reforestation when it was found the Board of Education could not own property outside of the city. Since the formation of the corporation a law has been introduced in the Legislature to permit the Board of Education to hold property outside of the city. The men teachers of the public schools under the direction of Principal Bentley, and boys of the Senior class have set out 20,000 trees on the farm. There are 10,000 white pine and 10,000 European larch. J. E. Davis, Chatauqua County forester helped with the work.

This step carries out the forestry club idea that has been adopted in states like Wisconsin, where at Wabena the second school forest has just been dedicated. Students old enough to plant trees where idle land is within reasonable distance can establish a forestry club. In New York the New York State College of Forestry is backing this movement. In 1927 there were 228,000 trees planted by school children in New York. Many trees were also planted by Boy Scouts and members of other boys and girls organizations. School forests will return a revenue and if the forest is large enough the income would maintain the school. Trees for this purpose are supplied without cost by the Conservation Commission. There is land in many counties that could be appropriated for school forests. It would seem if the forestry club idea was presented in a proper way to the students of public schools and opportunity given on Arbor Day or at other times to plant trees and get into the woods the school forestry clubs would meet with enthusiastic support and in many cases become a financial success. In all cases the club would be a great benefit both to forest conservation and to student education. Now the Jamestown proposition is incorporated and underway other schools doubtless will start plans going to the same end.

An example of putting idle land to work is found in New Hampshire where ten acres of apparently waste land about two miles south of Gonic were planted to white-pine seedlings by 23 boys. The land belongs to the ex-Governor S. D. Felker. Wm. Cullen, blister rust agent for Strafford County supervised the planting. The boys worked in pairs, one boy digging the hole while the other placed the tree and firmed it. Three-year white pine transplants were used. Some of the boys paid in seedlings which they will set out on their own land.

Women are rapidly becoming champion tree planters. A total of 95,956 trees have been planted by the Pennsylvania Federation of Women's Clubs in commemoration of the semi-centennial of the first step in forestry taken by the United States government. It is this date that prompted the publication of the Forestry Primer. At least 30,000 of the trees were planted for reforestation by three individual club members on their land. The seedling trees were obtained from the Pennsylvania department of forests and waters and were Norway spruce and white pine. On an acre of ground which was donated to it for the purpose of reforestation, one club planted 200 Japanese larch, 300 white pine, 300 red pine and 200 Norway spruce. The conservation chairman, Mrs. R. W. Stadden, of Bartonsville, planted a clump of four white birch trees in her lawn. One club near Philadelphia planted an evergreen tree which is to constitute the community Christmas tree.

The first prize of $25, offered by the Pennsylvania state president, Mrs. John B. Hamme, of York, for the largest number of trees planted, was won by the Abington Woman's Club of Clark's Summit. This Club, with a membership of 197, planted 21,321 trees. The second prize of $20, for the club planting the greatest number of trees in proportion to its members, was won by the Triology club of Biglersville. The 16 members planted 2,165 trees. The northeastern district of the state led in planting with 32,048 trees to its credit. Fifty-six clubs participated in the contest and so enthused did the club women become that it is likely that the planting of trees will hereafter be an annual activity of the Pennsylvania club women.

The Camp Fire Girls of Hastings, Mich., planted 2,000 white-pine seedlings this Spring, all on private land that was not in use. Several hikes to the places of planting assure the girls that the trees are growing.

Capital chapter, American War Mothers, dedicated evergreen trees, planted on Bryan Memorial hospital grounds at Lincoln, Neb. Seven gold star trees and three Chapter white star trees were dedicated. Mrs. C. E. Burton, president of the chapter, opened the ceremonies. She introduced Mrs. Jennie Cochran Schaberg, chairman of the memory tree committee. The address was given by I. D. Beynon, a world war veteran who saw service in the Meuse Argonne.

Mrs. William Howard Taft, planted a red maple tree on the Parkview playground in Washington. During the exercises the children danced about the tree singing the planting song, led by Dr. E. C. Barnes, supervisor of music of the public schools. Miss Emily Tilton is supervisor of the playground. Commissioner Sydney E. Taliaferro accepted the tree on behalf of the District of Columbia and Mrs. Susie Root Rhodes, director, on behalf of the playground department.

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for Fall Planting

Lilium Pardalinum
"The Panther Lily". Grows from 3 to 5 ft. high; blooms in July.
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